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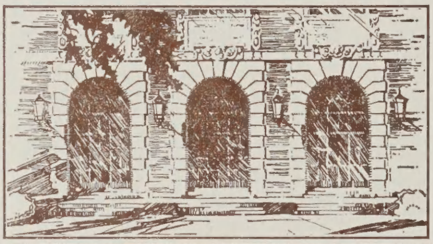

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THE LANCET

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CONTENTS

THE WHOLE OF THE LITERARY MATTER IN THE LANCET IS COPYRIGHT.

ECTURE on the Diagnosis and Treatment of Cerebral Syphilis. By GEORGE RIDDOCH, M.D., M.R.C.P. 1
UXLEY MEMORIAL LECTURE on Teleology and Evolution. By Sir ARTHUR KEITH, M.D., F.R.C.S., F.R.S. 50

ORIGINAL ARTICLES.

condary Operations Upon the Biliary System. By Sir BERKELEY MOYNIHAN, Bart., K.C.M.G., C.B., F.R.C.S. 4
one in the Common and Hepatic Ducts. By JAMES SHERREN, C.B.E., F.R.C.S. 7
andular Fever and Infective Mononucleosis, with an Account of an Epidemic. By H. LETHEBY TIDY, M.D., F.R.C.P., and E. C. DANIEL, M.B., B.Ch., M.R.C.S. 9
auma as a Possible Cause of Brain Tumour. By Prof. ERNEST S. REYNOLDS, D.L., M.D., F.R.C.P. 13

LINICAL AND LABORATORY NOTES.

wo Cases of Encephalitis Lethargica with Scarlatinal Desquamation. By J. LUMB, M.B., B.S., D.P.H. 14
Note on a Helminth Survey of a Gurkha Battalion. By Capt. R. C. WATTS, M.D., D.P.H., D.T.M. 15

MEDICAL SOCIETIES.

oyal Society of Medicine: Section of Surgery: Surgery of the Hepatic and Common Bile-Ducts 15
edical Society for the Study of Venereal Diseases: Metastatic Gonorrhœa 18

EVIEWS AND NOTICES OF BOOKS.

A Text-book of Pharmacology and Therapeutics. By Prof. E. Poulsson. Edited by W. E. Dixon, M.D., F.R.S. 20
Analytical Microscopy. By T. E. Wallis, B.Sc., F.I.C., Ph.C. 20
How We Resist Disease. An Introduction to Immunity. By Jean Broadhurst, Ph.D. 20
Anormale Kinder. By Dr. L. Scholz. Third edition by Prof. Dr. Adalbert Gregor 20
Untersuchungen über die Eigenreflexe (Sehnenreflexe) menschlicher Muskeln. By Paul Hoffmann 21
The Emotions. By Carl Georg Lange and William James. Edited by Knight Dunlap 21
Der Balken. By Prof. Dr. G. Mingazzini 21
Handbuch der gesamten Tuberkulose-Therapie. Edited by Prof. Dr. med. Ernst Loewenstein...... 21
Alfred Yarrow: His Life and Work. By Eleanor C. Barnes (Lady Yarrow) 22
British Journal of Children's Diseases 22

LEADING ARTICLES.

HOUSE INFECTION 23
THE SMALL-POX MENACE .. 23
THE NATIONAL PHYSICAL LABORATORY 24
A SPA FOR THE T.B.M. 25

ANNOTATIONS.

The Postponed Birthday Honours 25
Tuberculosis in Childhood . 25
Faith and Practice 26
The Registration of Disease 26
A Milk-borne Epidemic of Gastro-enteritis......... 26
A Post-graduate Course on Alpine Therapeutics..... 27
The Agent Producing Symptoms in Exophthalmic Goitre 27
Twin Tubal Pregnancy 27
Are Females Losing the Advantage of Low Mortality? 28
Chronic Eczema Produced by Wheat-flour 28
Bilharzial Appendicitis 28
Laboratory Diagnosis of Venereal Disease 29

MODERN TECHNIQUE IN TREATMENT.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

XXVII.—The Treatment of Asthma. By E. P. POULTON, M.D., F.R.C.P. 29

PUBLIC HEALTH SERVICES.

Reports of Medical Officers of Health: Coventry.—Grimsby.—Eastbourne.—Colchester. — Poole. — Swindon. — Maidstone.—Hyde.—Barry Urban District and Port.—Beckenham Urban District 36
School Medical Service: Derbyshire 38

SPECIAL ARTICLES.

Guy's Hospital Medical College: New Anatomy, Biology, and Physics Departments.—(*Illustrated*) 31
Research in Tropical Disease: III. The Lister Institute of Preventive Medicine .. 32
Treatment of Early Mental Cases in General Hospitals: Inauguration of Wards at Middlesex Hospital 32
National Baby Week Conference: Causal Factors of Infant Mortality up to One Month of Age.—Value of Maternity Homes in a Maternity and Child Welfare Scheme 33
Medicine and the Law: House-letting and Infection: Collins *v.* Hopkins 34
Notes from India: Education in Madras Presidency, 1917–1922 34
Czecho-Slovakia: Medical Fees and Improved Cost of Living.—First Czecho-Slovak Tuberculosis Congress 35
Harrogate Spa: New Facilities of Travel.—(*Illustrated*) 39

THE SERVICES.

Royal Army Medical Corps: Royal Naval Medical Service.—Royal Air Force.—Deaths in the Services 38

CORRESPONDENCE.

A New Word for "Defatted" Vaccines (Prof. Georges Dreyer) 40
The Differential Diagnosis of Small-pox and Chicken-pox (Dr. W. McConnel Wanklyn)............... 40
Is Diabetes Mellitus a Progressive Disease? (Dr. P. J. Cammidge)........ 40
Ethyl Chloride as an Anæsthetic for Minor Operations in Children (Dr. Harvey Hilliard)........ 41
Fibroma of the Ovary (Mr. Alban Doran) 41
Ancient Spanish Pharmacy Jars (Dr. Leonard Mark) 41
The Prophylactic Treatment of Puerperal Sepsis (Dr. Fr. S. Pitt-Taylor) 42
Experiences with Ethanesal (Dr. Charles T. W. Hirsch) 42
Children's Country Holidays Fund (Mr. Henry C. Gooch) 52

OBITUARY.

Sir James Reid, Bt., G.C.V.O., K.C.B., M.D... 42
Col. John Girvin, M.R.C.S. . 42
Edward Liddon, M.D. Edin., M.R.C.S., L.S.A......... 43

MEDICAL NEWS.

University of Oxford...... 43
University of Sheffield.... 43
Queen's University of Belfast 15
The Flower House, Catford 15
Donations and Bequests... 19
Small-pox in England and Wales 25
Royal Institute of Public Health 43
Epsom College 43
Society for the Study of Inebriety 44
Caledonian Medical Society 44
Complimentary Dinner to Dr. William Mayo 44
The Fellowship of Medicine and Post-Graduate Medical Association 44
Medico-Psychological Association of Great Britain and Ireland 44
Tuberculosis Conference at Birmingham 44
A Comfort for Invalids 49

PARLIAMENTARY INTELLIGENCE.

House of Lords: The Value of Garden Suburbs...... 44
House of Commons: Scottish Health Administration.—Typhus Fever in Skye.—Unemployment and Sickness in Salford.—Medical Research Grant.—Panel Practitioners' Conditions.—Mental Deficiency Administration.—Diagnosis of Small-pox.—Small-pox in Gloucester.—Tuberculous Treatment in Scotland.—Deaths from Cancer.—Ministry of Health Vote.—Pensions Disability Committee.—Changes in Pensions Headquarters in the North.—Nationality of Pension Doctors.—Medical Examinations in Nottingham.—Pitch Cancer.—Panel Doctors' Certificates.—Cancer Mortality.—Arm-to-Arm Vaccination.—Legacies to Hospitals ... 44

NOTES, COMMENTS, AND ABSTRACTS.

Health Conditions in Somaliland 51
Health of Government Officials in West Africa.. 52
People's League of Health.. 52
Professional and Business Women's Hospital League 52

INDEX NOTICE.

THE LANCET, Vol. I., 1923 . 25
Appointments. — Vacancies 49
Births, Marriages, Deaths 49
Medical Diary 52

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A Lecture

ON THE DIAGNOSIS AND TREATMENT OF
CEREBRAL SYPHILIS.

A Post-Graduate Lecture for the Fellowship of Medicine, delivered at the Royal Society of Medicine

BY GEORGE RIDDOCH, M.D. ABERD., M.R.C.P. LOND.,
FIRST ASSISTANT, MEDICAL UNIT, LONDON HOSPITAL; PHYSICIAN TO THE HOSPITAL FOR EPILEPSY AND PARALYSIS, MAIDA VALE.

THIS subject was chosen for discussion because, first, in the evolution of cerebral syphilis, widely different clinical pictures may be presented, giving rise to many difficulties in diagnosis, and, secondly, the disease can frequently be eradicated without leaving serious permanent disabilities if treatment is begun at an early stage and is sufficiently persistent. In cerebral syphilis the *Spirochœta pallida* has attacked mainly the meninges and blood-vessels. The neural tissues, however, rarely escape either direct invasion by the organism or local necrosis secondary to interference with blood supply; but encephalitis is superficial as compared with the deep and extensive process in dementia paralytica; hence the difference of the response to treatment. The pathological process may be limited throughout the course of the complaint to the intracranial contents, but usually the spinal cord, its roots or meninges are sooner or later also attacked.

HISTORY OF INFECTION AND DEVELOPMENT OF THE DISORDER.

When dealing with nervous disorders it is a commonplace to mention the importance of inquiry as a routine into the patient's previous history in regard to venereal infections. In men the history of chancre with or without a subsequent rash or sore-throat is obtained in a large proportion of cases of cerebral syphilis. Sometimes gonorrhœa but not syphilis is admitted, and later the Wassermann reaction is found to be positive. This important fact should be remembered, for there is no doubt but that an unobtrusive chancre may run its course unnoticed when the local reaction to gonococcal invasion is severe. In women this part of the investigation is more difficult, for it is, of course, as a rule undesirable to ask direct questions on this subject; but even when this is done a negative history of primary or secondary lesions is usually obtained. If the woman is married an inquiry into the results of her pregnancies should never be omitted.

Symptoms of cerebral syphilis may appear within a few months or even weeks of the infection or may be delayed for years. The development of the disorder as revealed by the history of the patient's symptoms is of great diagnostic importance. No symptom of which he may complain is peculiar to cerebral syphilis, nor can the grouping of symptoms and signs at any phase in the malady be made the basis of a confident diagnosis. But when the patient relates a story in which, for example, paroxysmal severe headaches, attacks of giddiness, transient cranial-nerve palsies, or mental deterioration are prominent, and the clinical examination reveals signs of multiple cerebral lesions, there is presumptive evidence of cerebral syphilis. The diagnosis is more certain if he admits syphilitic infection, and is complete if the specific serological tests are found to be positive.

Common characteristics of cerebral syphilis might be categorically stated as follows: (1) Multiplicity of symptoms pointing to organic lesions; (2) their frequent transient nature; (3) the consequent changefulness of the clinical picture presented at different stages in the evolution of the disorder. These features, however, may be said to be equally characteristic of two other diseases of the central nervous system—namely, disseminated sclerosis and encephalitis lethargica. We will deal with their differential diagnosis as occasion arises.

COMMON CLINICAL MANIFESTATIONS IN CEREBRAL SYPHILIS.

It would be unprofitable in a single lecture to attempt to describe fully the symptomatology of cerebral syphilis in relation to diagnosis. Our time will be better spent if we confine our attention to the more common clinical forms of the disorder and to deal with diagnostic difficulties under each symptom-group.

Headache, Vomiting, and Giddiness.

One of the almost constant early symptoms is headache. It is usually severe and may be described as throbbing and stabbing, and, at its height, often stupefying in its intensity. Although paroxysmal, each attack usually lasts for hours and may persist for days on end. The pain may be worst in some region of the head, but it is most commonly general and often associated with tenderness of the scalp as a whole. When the pain is circumscribed—for example, in the frontal, temporal, or occipital region—and is accompanied by a fan-shaped area of cutaneous tenderness spreading upward, it is generally due to involvement of the corresponding cutaneous nerves in a gumma of the skull or its coverings. Between the paroxysms the pain may disappear, but more commonly a dull ache persists. Too much has been made of nocturnal aggravation of the syphilitic headache. During attacks of severe pain the patient is frequently giddy and may vomit repeatedly, and sometimes he is found on examination to have either optic neuritis or papillœdema. The occurrence of these symptoms with or without other clinical manifestations raises the question of cerebral tumour. When cranial-nerve palsies are present without pupillary abnormalities the differential diagnosis between tumour of the basal membranes and syphilitic basilar meningitis often depends entirely on the results of examination of the blood and spinal fluid.

Cranial-Nerve Palsies.

Very few cases of syphilitic meningo-encephalitis run their course without involvement of one or more cranial nerves and, with affection of the basilar membranes, they tend to be attacked early. The palsies that result from these lesions are frequently transient, and throughout the course of an illness signs of damage to several cranial nerves may appear at one time or another and leave little or no permanent disability. Any cranial nerve may be attacked, but some are more commonly injured than others. Disorders of smell are not rare, and limitation of the visual fields on one or other side may be an early sign from invasion of the optic nerves, chiasma, or tracts. Papillœdema when present is usually bilateral, but optic neuritis may occur on one side only. Unilateral deafness is very common and may be associated with weakness of the facial muscles on the same side and pain and tenderness of the skin in the distribution of one or more divisions of the fifth nerve. But pupillary abnormalities, such as a fixed dilated pupil, ptosis, diplopia, or squint from lesions of the third or sixth cranial nerves, are most common of all. The fourth nerve is less often affected. These oculomotor signs may be unilateral or bilateral and are often evanescent.

Of disorders of the pupil the Argyll Robertson phenomenon is the most diagnostic, but in regard to it a word of warning is necessary. First, it is less frequently found in cerebral syphilis than in tabes and dementia paralytica, and its absence should not necessarily be taken as evidence against a diagnosis of syphilitic infection. Secondly, although this sign is most often a manifestation of neurosyphilis it is not

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pathognomonic of it. It signifies a lesion in a particular part of the mid-brain which, though usually syphilitic, is occasionally due to some other cause. For example, it sometimes occurs with tumour in this region, or with encephalitis lethargica. Thirdly, defective reaction of the pupils to light is as significant as complete absence of response. For example, the movement may be small, sluggish, or delayed and, in spite of continuous stimulation, contraction may be immediately followed by dilatation or to-and-fro movements of the pupil may go on. The diagnostic value of these latter abnormalities is enhanced if they are unilateral. Irregularity in outline or eccentricity of the pupil may also be met with.

Transient cranial-nerve palsies are as common in disseminated sclerosis as in cerebral syphilis, but pupillary changes and severe paroxysmal headaches are very rare in the former, and nystagmus is rare in the latter. When physical signs are present elsewhere they may aid the diagnosis, but many are common to the early stages of both conditions. Manifestations of root lesions, such as local atrophies, or pain and tenderness of radicular distribution, would strongly favour a diagnosis of syphilis. Often differentiation between the two disorders on clinical grounds only is extremely difficult, and must rest on serological tests.

Changes in pupillary reactions are common in encephalitis lethargica, but defective reactions on accommodation or convergence are perhaps most frequently found, although the Argyll Robertson phenomenon sometimes occurs. When in this disorder alterations in the reactions of the pupils are present, they are usually accompanied by lethargy or insomnia, a combination of symptoms which is by no means unknown in cerebral syphilis. Mild pyrexia may also occur in both, so that on clinical grounds only it is sometimes impossible to make a diagnosis. In such circumstances, examination of the blood and spinal fluid is of the greatest value.

MENTAL CHANGES.

Because of the striking nature of the mental alterations in dementia paralytica they have become well recognised. But clinicians are less generally familiar with the psychological abnormalities that are to be found almost constantly in subjects of cerebral lues during some phase or other of their illness, and may be the most prominent feature of the clinical picture presented. This hiatus in general medical knowledge of the disorder may be in part ascribed to the varied character of these mental changes, and also to their close resemblance to some neuroses and psychoses. Thus, in milder cases, the symptoms complained of may at first sight be indistinguishable from those of neurasthenia. The patient is listless, depressed, tearful, worried over trifles, has great difficulty in paying sufficient attention to his business, and in being interested in affairs that used to engross his attention : his memory for recent events is faulty and his diminished efficiency is a source of great worry to him. The resemblance of this disordered mental state to neurasthenia is enhanced by its changefulness in that periods of spontaneous improvement occur.

By careful attention to the nature of certain symptoms, however, points of distinction can often be made out. For example, the neurasthenic headache is more a discomfort than a pain. It is often described as a sensation of weight on the top of the head or of pressure in the temples, or as if a band were constricting the head. On the other hand, the characteristic headache in cerebral lues is severe, prolonged, and prostrating and may be associated with repeated vomiting. Again, the syphilitic looks more ill, is more tremulous, and his fears are less liable to be temporarily dissolved by robust optimism and reassurance. But although these distinctions may excite suspicion, the diagnosis really rests upon the results of careful inquiry into the mode of onset and development of the illness, the question of venereal infection, and examination of the patient for physical signs. If the diagnosis is still in doubt, the reactions of the blood and spinal fluid should be investigated It should, of course, be remembered that neurasthenic symptoms in a patient who has been infected with syphilis does not necessarily mean that they are manifestations of meningo-encephalitis or arteritis Although the infection may have been effectively treated at an early stage the patient may doubt the completeness of the cure and dread a recrudescence of the complaint in some terrible form. Under such circumstances a neurosis may readily germinate and develop in a sensitive individual. Suicides from this cause are not unknown. Many syphilophobics have had syphilis, but not all have been cured of their infection, and in every case thorough investigation is an essential preliminary to diagnosis and treatment.

Not uncommonly in cerebral syphilis more severe grades of mental derangement are met with. The neurasthenia-like state we have been considering may be interrupted by a phase of delirium or maniacal excitement, and if the patient is first seen in one of these attacks the diagnosis of the underlying cause may be very difficult. In the delirium there may be complete disorientation with visual hallucinations, but, unlike the hallucinations in delirium tremens, these do not usually take the form of loathsome animals and horrible faces. The absence of evidence of peripheral neuritis and the presence of Argyll Robertson pupils and other suggestive signs aid the diagnosis. An accurate account of the patient's previous health and of his habits would, of course, be of great help, but this is not always easy to obtain from relatives and attendants.

Sometimes periods of excitement alternate with periods of semi-consciousness in which purposive actions, such as ordinary household duties, may be carried out without any memory of them being retained.

An interesting mental disorder in relation to diagnosis is one in which there is an uncontrollable desire to sleep lasting for days, often succeeded by insomnia. When prolonged lethargy of this kind is an early symptom, encephalitis lethargica would naturally be suspected. As already mentioned, diplopia and defective reactions of the pupils, to light or on accommodation or both, are common in this disease and are another source of confusion. Often the diagnosis must rest on serological tests. A lymphocytosis in the cerebro-spinal fluid may be found in encephalitis lethargica as well as in cerebral syphilis, but in the former the Wassermann reaction (W.R.) in both blood and spinal fluid is negative.

Any of the mental disturbances we have so far considered may pass into dementia, and although it is denied by some observers, there is no doubt but that intellectual and emotional impairment may gradually develop as the sole manifestation of disordered mental function in cerebral syphilis. The following excellent example is at present under my care in the London Hospital.

A man of 43 contracted syphilis in 1903 in South Africa. He had held a good position and had average ability. In 1912, while acting as assistant purser on board ship, he had a seizure, after which he was aphasic and paralysed on his right side. He lay in a stuporose state for three or four days, refusing food, and passing urine and fæces under him. Some time later in the same year he was admitted to the London Hospital under the care of Dr. Henry Head ; in the hospital records it is stated that he was dull and apathetic and lay curled up in bed, speaking only when he was questioned. He gave sensible answers to simple questions, but his memory even for past events was very poor and his attention feeble. He was completely disorientated in regard to time and was unable to give correctly his age or dates of occurrence of prominent events in his life. He did not suffer from headache, but vomited occasionally and had incontinence of urine and fæces. Careful examination of his nervous system failed to reveal any other abnormalities, except tremulousness of his hands. The W.R. in his blood was strongly positive but negative in his spinal fluid, which contained only two cells per cubic millimetre.

Between May, 1912, and October, 1913, he was given a course of mercurial inunctions and two injections of salvarsan ;

improved considerably, but remained mildly demented, ading an idle existence, apparently without interest in ything. Until recently he has been living on a farm, t unless someone was continually with him to spur him on, could not direct his attention or stimulate his interest en for a short time to carry out simple duties. He is not all resistive, but is apathetic and listless and has no desire do anything. His memory is still very defective, and he as disorientated as he was before. There is a very slight eakness on voluntary movement of his face and tongue d palate on the right side, and although his pupils act well to light the contraction is not maintained. he W.R. in the blood is still positive, but the spinal uid is normal.

This case is of interest for several reasons: (1) It is good example of simple dementia due to meningo-ncephalitis; (2) onset after an apoplectiform seizure not uncommon in such cases; (3) few physical igns are present; (4) the improvement up to a oint with antisyphilitic treatment; (5) the non-rogressive character of the disability during the last en years; and (6) absence of changes in the spinal luid.

I have enlarged upon this case also in order to tress the fact that dementia in a syphilitic subject loes not necessarily mean general paralysis of the nsane. The distinction is important, for dementia aralytica is invariably fatal within a few years of ts onset, and treatment is of little or no avail in rresting its progress. Further, I am convinced that s the result of wrong diagnosis many cases of meningo-ncephalitis with dementia are sent to asylums as ncurable, and in consequence are not treated. In lementia paralytica remissions and relapses occur, ut its course is progressive, leading to increasing nental and physical deterioration; the W.R. is robably always positive, not only in the blood but also in the cerebro-spinal fluid, which in addition shows an increased globulin content, lymphocytosis, and the so-called paretic form of colloidal gold curve.

Before leaving the subject of dementia as a manifestation of cerebral syphilis, another diagnostic difficulty must be mentioned. When the disorder appears in adolescence it may easily be confused with dementia præcox. The resemblance is increased if negativism is present, as it may be. But a careful inquiry into the evolution of the illness, together with a search for signs pointing to focal cerebral lesions and investigation of the reactions of the blood and spinal fluid, will clear the diagnosis.

Hemiplegia.

It is, I am sure, unnecessary to remind you that hemiplegia, occurring in a patient under middle age who is not a subject of cardiac disease, is very frequently due to cerebral syphilis. Strictly speaking, it is perhaps most frequently a manifestation not of meningo-encephalitis but of arterial disease, and although the W.R. is positive in the blood it is commonly negative in the cerebro-spinal fluid. When, however, it is accompanied by changes in the pupils, cranial-nerve palsies, or evidence of spinal-root lesions the spinal fluid usually shows specific alterations.

Epilepsy.

Jacksonian attacks are well-recognised symptoms of meningo-encephalitis of the convexity of the brain, and I need not do more than mention them in passing. But I wish to draw attention to the undoubted occurrence in cerebral syphilis of recurring seizures, often indistinguishable from those of idiopathic epilepsy. This clinical form of the disease is not common, but along with cerebral tumour it should be kept in mind when a patient over 20 develops epileptic seizures for the first time. They may be of either the grand mal or petit mal variety and usually recur at fairly long intervals. A feature of them which may help in diagnosis is that the patient is often dazed or stuporose or a longer time after the attack than is usual in diopathic epilepsy. Pupillary abnormalities or other organic signs, when present, would suggest the possibility of syphilis as the underlying cause and the W.R. ought to be examined. It is needless to say, however, that a positive W.R. in an epileptic does not necessarily prove that syphilis is at the base of the complaint; but if physical signs are present and antisyphilitic treatment has a beneficial effect it is practically certain that the syphilitic infection is the cause.

Value of Laboratory Tests in Diagnosis of Cerebral Syphilis.

Discussion has recently been renewed in regard to the diagnostic value of the W.R. in syphilitic infections. In relation to diseases met with in this country, with a few known exceptions, it can confidently be said that a definitely positive reaction indicates infection with syphilis, when the test is performed by a competent clinical pathologist. A negative result, however, is not always of the some clear value in diagnosis. For example, in tabes a negative reaction in the blood is by no means uncommon during a quiescent phase; even in the spinal fluid the reaction is sometimes found to be negative.

In cerebral syphilis when the disease is progressive a positive W.R. in the blood can almost always be obtained. In the cerebro-spinal fluid the reaction may be positive or negative. It may be negative when the disease is confined to the cerebral arteries, or sometimes—as in the case of the dementia I have quoted—even when the pathological process is more extensive but the contents of the spinal canal have escaped. A positive W.R. in the spinal fluid is practically always accompanied by lymphocytosis, increased globulin content, and a positive colloidal gold curve.

Treatment.

When cerebral lues is diagnosed early, and suitable treatment instituted, good results in a large number of cases can be expected. The disease can frequently be eradicated, and failing this ideal result improvement almost always takes place. But to attain this end treatment by antisyphilitic remedies must be carried out for a long time, and, equally important, it should be judicious. To get the maximum beneficial effect the physician should never lose sight of the patient's general health in his eager attack upon the disease. The drugs used are, in large doses, highly poisonous, and idiosyncrasies to them are not rare.

In severe cases of cerebral syphilis, when the patient is in poor health or when his mental functions are seriously disordered, he should, during treatment, be confined to bed until his condition improves. His diet must be supervised, and when somnolent he may have to be artificially fed.

Insomnia and restlessness or maniacal excitement can best be treated by warm baths and hypnotics, such as paraldehyde or veronal. A useful drug for this purpose is morphine bimeconate in a 2 per cent. aqueous solution. It is given by the mouth in water, an average dose being 25 or 30 minims, repeated in two or three hours if necessary. It has a most soothing effect, especially in cases of nocturnal restlessness. Severe headaches may be the cause of sleeplessness, and when so the treatment of insomnia lies in giving relief from pain. In such circumstances the following powders will be found useful. The basis of them is 5 gr. each of aspirin and pyramidon. If this fails to give relief, one-twelfth or one-sixth grain of heroin hydrochloride should be added. This will usually be successful; but if the patient, although free from pain, is still unable to sleep, the addition of 2½ or 3 gr. of veronal will be sufficient in most cases to give the desired result.

For epileptic seizures sedatives as well as antisyphilitic drugs are necessary. In my experience a combination of bromide and luminal-sodium is best. An average dose is luminal-sodium gr. i., sodii brom. gr. v. with liq. arsenicalis ♏ ii., and inf. gent. co. ½ oz.

twice or thrice daily; but the dose must be suitably adjusted in each individual case. A localised gumma of the meninges on the convexity may have to be removed by operation, if it is giving rise to progressive symptoms of cerebral tumour which antisyphilitic treatment fails to relieve. There is no absolute contra-indication to the use of antisyphilitic remedies, but for old and feeble patients, especially when the kidneys are diseased, small doses should be used and a close watch kept on renal function.

Of the drugs at our disposal arsenobenzol compounds, mercury, and potassium iodide are the most important. Novarsenobillon is the arsenical preparation most used in this country, in doses of 0·15 to 0·9. In my opinion, as a single dose 0·6 g. should rarely be exceeded, and in order to ascertain the patient's tolerance to the drug it is wise to begin with small doses. The drug can be given intravenously, subcutaneously, or intramuscularly. If the subcutaneous or the intramuscular method is employed the drug must be dissolved in aqueous glucose or an oily medium. Sicard, who advocates these methods, uses novarsenobenzol, galyl, or sulpharsenol in small doses—0·15 to 0·2 g., repeated every two days for two months. The injections are said to be almost painless, and excellent results are claimed for this form of treatment.

The method I usually adopt is to give four or six weekly injections of novarsenobillon. This is followed by a course of three or four weeks' duration of mercury either in the form of inunctions or by mouth, together with potassium iodide. An interval of three or more weeks, according to the condition of the patient, is now allowed to elapse before treatment is again begun. The effect of treatment should be gauged at the end of each complete course, not only by the clinical condition of the patient, but also by the reactions of his blood and cerebro-spinal fluid; for it must always be remembered that the disappearance of the patient's symptoms does not necessarily mean that his disease has been cured.

Treatment should be continued periodically, even after improvement in the laboratory tests and in the clinical state has ceased. In general, after two to four complete courses of novarsenobillon, mercury, and potassium iodide, further treatment should be delayed for from 6 to 12 weeks. The necessary precautions during treatment with mercury and potassium iodide and the symptoms of poisoning by these drugs are well known and need not detain us now. But the dangers associated with the administration of arsenic may be mentioned. In the first place, patients with an idiosyncrasy to the drug are now and again met with, hence the advisability of testing as a routine the tolerance to organic arsenic by the administration of an initial minimum dose. When there is an unusual susceptibility to the drug the patient, within a few minutes of the injection, may be seized with malaise, vomiting, and pyrexia, and an erythematous rash may appear. Secondly, sometimes a more intense and even fatal reaction of the nature of anaphylactic shock is met with. On the day after the first or a subsequent injection of novarsenobillon convulsions, pulmonary œdema, and coma may rapidly develop and the patient may die. Thirdly, a few hours after an injection the patient's symptoms may be temporarily increased—the so-called Herxheimer reaction. The appearance of one or other of these reactions is a contra-indication to either further use of arsenic or, if it is continued, the employment of more than minimum doses. Lastly, prolonged and injudicious administration of arsenic will lead to chronic poisoning, of which early symptoms are erythematous eruptions, jaundice, and peripheral neuritis. Arsenic therapy must then be discontinued for at least two or three months.

In closing, let me again insist that either disappearance of symptoms or a stationary clinical state is not by itself a reliable indication of cure of the disease. But in general the syphilitic infection has been eradicated when in addition the specific tests in the blood and spinal fluid have remained negative for five years.

SECONDARY OPERATIONS UPON TH BILIARY SYSTEM.[1]

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THE subject allotted to me in this discussi concerns those cases in which a recurrence of sympto takes place after an operation upon the common bi duct. About one-fifth of the total number of patien suffering from cholelithiasis upon whom I opera have previously been submitted to operation for t condition. Secondary, tertiary, or multiple operatio upon the biliary system may be made necessary a variety of causes, among which the chief are t nature and condition of this disease, and of its co plications and remote effects; and imperfect prima operations.

Factors in Stone Formation.

A study of the nature and condition of the disea must chiefly have regard to the factors bringi about the formation of stone. These factors are dua infection reaching the bile channels, and an increa in the cholesterol content of the blood. The gre majority of the stones which require removal a formed in the gall-bladder; when stones are found the ducts it is because they, or the small partic from which the larger stones develop, have escap from the gall-bladder. But there are cases, happi few in number, in which stones are formed in t smaller ducts within the liver, or in the larger duc which lead to the intestine. An infection ma reach the gall-bladder from several directions—fro the blood-stream; from the bile flowing downward from the liver; from the lymphatic plexuses of th appendix, pancreas, liver, &c., which most free anastomose with that of the gall-bladder; from th common duct, which in turn receives infection fro the duodenum; and finally, by contiguity throug adhesions to neighbouring organs. Though these a the direct and proximal routes, it is evident that t infection travelling along them is not necessarily primary infection in the organ from which it immediately derived. Infection coming from th liver may be primary elsewhere in the body, gai access to the blood-stream, mature in the spleen, an ultimately reach the liver by way of the spleni vein. A search for infective lesions must therefo involve a scrutiny of the whole body, so that th most lurking area of infection may be revealed. failure to discover such an infection may be responsib for a recurrence of stones in the gall-bladder, th liver, or its ducts.

The cholesterol content of the blood is an importan agency in the causation of gall-stones. We have stil a good deal to learn with regard to cholesterin, an its presence in the blood in excess in certain conditions. Blood cholesterol determinations have bee made for me by Miss Shiskin on a large number o patients suffering from various abdominal disorders and 100 consecutive cases have been scrutinised fo the purpose of this review. In conditions other tha cholelithiasis or cholecystitis, low or normal values have been found to be the rule. In uncomplicated cases of cholelithiasis, on the other hand, the cholesterol content of the blood tends to be high. Thus in 40 such cases examined the blood cholesterol values ranged from 0·133 per cent. to 0·409 per cent., the average value being 0·210 per cent. If we take 0·160 per cent. as the average normal figure, with 0·192 per cent. and 0·133 per cent. as the upper and lower normal limits, 60 per cent. of the cases are seen to be hypercholesterolæmic, and, although in the remaining 40 per cent. the cholesterol content of the blood is normal, it is to be noted that in three-quarters of these (that is 30 per cent. of the total) high normal values have been obtained.

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[1] The opening remarks made at a discussion on the Surgery of the Hepatic and Common Bile-ducts at the Royal Society of Medicine on June 27th, 1923.

In all the cases of cholelithiasis examined a marked l in the cholesterol content of the blood was served shortly after the operation. This fall is not nfined to cases of cholelithiasis. It has been ted by me in diverse other conditions after major gical procedures, for example, after prostatectomy, strectomy, splenectomy, &c. In the cases under cussion the fall is to be attributed sometimes to the ect drainage of the biliary passages, but the effects the anæsthesia, the slight elevation of temperature netimes present after an operation, and, indeed, disturbed metabolism consequent on operation, ist all be regarded as contributing factors. Subse- ent re-examinations show that after the initial l there is a rise, in some cases, a progressive one, so at the cholesterol content of the blood may soon ich the pre-operative figure. Such cases belong to e diathetic group; that is to say, they are more less continuously hypercholesterolæmic, and even er operation for cholelithiasis the hypercholesterol- nia may persist. In the majority of the patients, wever, the cholesterol content of the blood had len to normal and was found to have remained at e normal level when examined 14 months after the eration.

The treatment of the patient after operation must erefore take into account this condition of hyper- olesterolæmia. The following instructions as to et are given to all patients after operation:— ticles of diet which must be avoided: Yolk of egg, ains, kidneys, sweetbreads, liver, goose and duck, rk and game, fat, stewed and fried meats, cream d cheese, fresh fruit and green vegetables (for three onths), butter (only to be taken in small amounts, at all). A recurrence of symptoms after an opera- n upon the common bile-duct may also depend on the following circumstances.

Imperfect Primary Operations.

1. Stones may be overlooked or left behind in any rt of the extrahepatic ducts, including the ampulla Vater. There are times when even a practised rgeon may have his doubts about the presence of stone in the common duct. In cases when the gall- adder is thick and shrivelled, and has ceased to rform its functions, the common duct may be found t a little dilated. After the gall-bladder has been moved the same change constantly occurs. What utherford Morison calls the "natural cure" of olelithiasis consists in the closure of the cystic ict and the shrinking of the gall-bladder until it comes a mere fibrous or calcareous covering for the ones remaining inert within its cavity. The common ict then may be obviously, even grossly, dilated. he question of how best to decide whether such a ict contains a stone is one that surgeons answer fferently. The enlargement of glands along the uct and the presence of hard nodules in the head the pancreas may cause the surgeon to feel almost nfident that a stone is present. And in such cir- imstances the opinion is very generally given that ie duct should always be opened and "explored." disagree most confidently. Exploration of the duct ith anything but the finger is a most uncertain iethod of discovering or locating a stone. A probe a small scoop will miss a calculus, even one of good ze, over and over again, especially if it happens to e in a little pocket aside from the main channel of ie duct. Beyond any question the surest method of eciding whether the duct contains a stone is to pass ie first and second fingers of the left hand through ie foramen of Winslow and the thumb in front of it, nd to palpate the duct and compress it between the ngers and thumb, as they travel gently upwards nd downwards. To the expert fingers the tiniest agment of stone can be felt as soon as the duct is mpty of bile. The left hand of an assistant, if he too expert, should carry out an independent investiga- ion. During the last few years I have rarely opened a ommon duct merely for the purpose of deciding hether it contained a stone. The exploration of a ufficiently dilated duct can be carried out with the left forefinger passed inside it with the extreme probability that with adequate skill and unwearied patience the last fragment of stone will be discovered.

When a stone which lies concealed in the ampulla of Vater has been overlooked at the primary operation, the duodenum should be opened and McBurney's or Kocher's operation performed. After either of these operations the drainage of bile into the duodenum is very free and unimpeded. I am very fond of both of these methods. They can be performed with the utmost daintiness and precision, with extremely little risk, and with the confident prospect of a perfect result. The making of a large opening at the lower end of a dilated duct, with, or more often without, the suture of the duct edges to the duodenal wall, will allow stones of even medium size to escape readily into the intestine. I feel sure that these operations are not practised sufficiently often. I am beginning to entertain a belief that they may be the safest of all operations upon the common duct, and those in which there is the most confident prospect of complete relief for the future. At least I can claim that their range should be greatly extended. Even when it is not necessary to open the duodenum the dilatation of the lower part of the duct from above is a most useful procedure. It may be effected by the passage of probes of the type suggested by Mayo, or by the passage of a rubber catheter through the duct into the duodenum. A later reference will be made to this procedure.

2. Particles of grit may be left in the lower intra-hepatic ducts, or in the hepatic or common duct, and inadequate drainage may not give them time to escape. The question of drainage after the operation of choledochotomy is one that still exercises the minds of surgeons, and certain surgeons who ought to know better are practising and advocating the immediate suture of the duct after every operation upon it. In every case of obstruction of the common duct by calculus there is cholangitis, and in a large number of cases there is mud, or dust, or sand, in addition to the larger stones. When there is a large solitary stone of recent descent from the gall-bladder, the closure of the duct may sometimes be safely performed. I have done this a few times in years gone by, always with a feeling of anxiety during the few days following operation, and with no ultimate advantage of any kind to the patient. I make it a rule, and have done for many years, to drain the hepatic duct in all cases of multiple stones. Some of the patients are gravely ill, and in them the method of McArthur of passing a catheter down the duct into the duodenum for the purpose of giving fluid nourishment is invaluable. The catheter acts by the method of "continuous dilatation," which Sir Henry Thompson originated and wisely advocated for the treatment of urethral stricture. Any narrowing of the common duct is, for a time at least, completely overcome, and during that time the smaller stones or the coarse dust and mud of the ducts above are able to escape into the intestine. I give through this tube a 5 to 15 per cent. solution of glucose, with a little carbonate of soda, by the "drip" method, interrupting the steady flow every three or four hours, to give a meal of peptonised milk, beaten eggs, &c. As much as 10 to 12 pints of fluid a day may be introduced in this way with great advantage. The tube remains for ten days to a fortnight.

When many stones and much mud have been removed from the common and hepatic ducts, small particles of grit may long continue to descend upon the gauze strips passed up into the ducts to clear them. In such cases I pass Carrel tubes up into as many of the intra-hepatic ducts as I can recognise. These ducts are sometimes so large as easily to contain the finger, and there is no difficulty in passing tubes into them. Around the common-duct incision a barrier of dental rubber is placed. At the end of 24 to 36 hours, when the peritoneal cavity is sealed off, I start the intermittent irrigation by the method of Carrel, washing the ducts out with large quantities of sterile salt solution or plain boiled water. In one such case the nurse counted a few hundred stones and weighed them, and finally weighed the total mass of tiny stones and particles of coarse dust washed down from the liver. She assessed their total number in this way, as "well over a million"! The operation was four years ago, and there has been no recurrence of symptoms, though the operation I performed was the fourth attack made on the common duct. For the first ten days an abundance of fluid was given through a catheter passed into the duodenum. This case raised the question as to the origin of the infection responsible for the formation of the stones. It would appear that in such cases the most likely route of delivery of infective material to the liver is by the splenic vein. In a later case than this, where the spleen was slightly enlarged, I performed the sixth operation upon a patient, drained the blocked hepatic ducts of many thousands of small stones, and then removed the spleen. The washing out of the ducts continued for six months; after that time the bile drained away through the wound, which has closed and broken down again several times since, but stone formation appears definitely to have ceased. I therefore advocate drainage of the hepatic duct in all cases of multiple calculi; drainage with irrigation of the ducts in many of the cases, especially the secondary ones, in which the ducts contain great quantities of mud, the employment of the method of McArthur of catheterism of the lower part of the duct; and in cases in which the lowest part of the duct contains calculi, a more frequent resort to the operation of McBurney. If typhoid organisms are found in the bile the administration of urotropine by the "thump" method is necessary. Thirty grains of acid sodium phosphate in one pint of water are taken during the day, and at night a single dose of urotropine beginning at 30 and increasing to 60 gr. is taken. At the end of a week a respite of a few days is allowed during which alkalies are given. The administration of urotropine again begins and is again interrupted.

3. In cases of primary cholecystectomy failure to divide the cystic duct at the proper place may be responsible for disaster. The variations in the mode of entry of the cystic duct into the common duct and of the variations in the vascular supply of the gall-bladder and ducts have not been sufficiently considered by surgeons in the past; the recent work of E. R. Flint in this connexion may be studied with great advantage. The cystic duct not infrequently runs for an inch or more side by side with the common hepatic duct, to which it is closely bound, until it enters with it into the formation of the common duct. The two may, indeed, not unite until they almost reach the duodenum. If a long piece of the cystic duct is left behind a stone may lie within it and there increase, or may quietly migrate from it and escape into the common duct. On the other hand, too much of the cystic duct may be removed, and with it a piece of the common duct, or of the hepatic duct. The pelvis of the gall-bladder is at times so intimately adherent to the common duct that when the gall-bladder is lifted up to enable the cystic duct to be cleared, the common duct may be stretched, and then so closely resemble the cystic duct that the greatest care is necessary to distinguish them. The inviolable rule in the surgery of the gall-bladder and of the common duct is this: "See exactly what you are doing, and until you see do nothing." On four occasions I have removed a part of the common hepatic or common bile-ducts, happily not to a degree prejudicing the recovery of the patient, because immediate repair of the duct was performed. If this tragedy should occur it should be redeemed at once. The parts are then all in view, and supple, and restoration is not by any means as difficult as it will prove to be in later weeks or months. It is the surgeon who bungles in this fashion who is then the only sufferer. He feels that the operation has not displayed that degree of ease and mastery in efficient action which stamp the artist; and he has the misery of knowing that he has given less than his best to his patient.

If too much of the cystic duct is removed, and with it a part of the common duct, a stricture of the latter may result. This stricture may itself be responsible for symptoms which closely resemble those of a floating stone, or be the means of causing that degree of stagnation of bile which leads to infection and makes easier the formation of a stone. A few cases have come my way in which a complete segment of the common duct had been excised, and I have had to reconstruct the duct or to anastomose the hepatic duct to the duodenum.

Improper Operations.

At the primary operation upon a case of cholelithiasis when stones are present both in the gall-bladder and in the common duct, the question as to the best procedure to adopt with reference to the gall-bladder will always arise. At a time when operations were performed with difficulty and attended by grave risk, at a time, too, when relief from symptoms after operations by competent surgeons was less frequent than it is now, it was felt that removal of the gall-bladder was unwise. If mistakes were to be made at all, it was safer to make the mistake of leaving the gall-bladder than the mistake of removing it; the former error could be made good, the latter was almost irreparable. But as the quality of surgery improved, and as by degrees we learnt that recurrence of stones in the common duct was so frequently due to recurrence first taking place in a gall-bladder which had only been drained, and that pancreatitis might arise and often probably did arise by extension from the walls of a diseased gall-bladder, the practice of the removal of the gall-bladder grew more common. A study of its walls showed often that they were filled with organisms, and that the elastic and muscular coats were so thoroughly disorganised, and the mucosa so changed, as to render the viscus incapable of adequately fulfilling its functions either as a reservoir competent to discharge its contents on demand, as a regulator of the rate of discharge of bile, or as an organ secreting a constituent which it was proper for the bile to possess on entry into the intestine or otherwise. The cases in which the gall-bladder is needed for anastomosis with the duodenum at a second operation are now so exceedingly few that this consideration need hardly weigh with the surgeon as he reflects upon the course he is to follow.

The present practice of most surgeons whose experience is large is to remove the gall-bladder at the time the common duct is emptied of its stones.

Involvement of the Pancreas.

There are conditions of the pancreas, its chronic or subacute inflammatory states, that may cause a very close mimicry of the symptoms of calculous obstruction of the common duct. The frequency of the association of disease of the pancreas with cholelithiasis is variously estimated by different observers. The pancreatic changes are not easily measured during an operation. It is difficult to gauge the size of an organ so long and so remote with any approach to accuracy; and qualities of texture in respect of hardness, in one part or another, cannot be expressed in terms that make one surgeon's experience comparable with that of another. Removal of a portion of the pancreas is open to the fallacy that the area chosen may not be equally involved with the rest of the organ. But with all due and necessary allowance for these truths there can be no doubt of the frequency, and the occasional grave severity, of the pancreatic changes. The route by which infection reaches the pancreas is not necessarily the same in all cases. The cause of the cholelithiasis may be the cause of the pancreatitis, or the latter may be the consequence of the former. If the pancreatitis is secondary to cholecystitis the infection may travel from the gall-bladder down the common duct, and along the canal of Wirsung; or it may pass in the lymphatic plexus which is common to the two. Some clinical and all experimental evidence (especially Nordmann's) suggests that invasion by the ducts is the more likely; but there is evidence, too, derived from operations, that lymphangitis may be the chief factor in causing the changes in the pancreas. Whichever may be, in any special case, the correct explanation, it is evidently a safer plan to remove the gall-bladder than to drain it. Cholecystectomy is beginning to displace cholecystenterostomy in the treatment of chronic pancreatitis, as a result, chiefly, of the advocacy and practice of Deaver.

The typical symptoms of calculous obstruction of the duct may occur in the absence of calculus. In operating upon such cases it is a little disconcerting to find a distended common duct in which no stone is present. The head of the pancreas, especially, will be found enlarged and hard and œdematous. The duct lies in such intimate relationship with the gland, that a swelling of the latter compresses the duct, causes stagnation of bile, and consecutively a degree of cholangitis that may be very severe. In such cases the T-shaped tube of Kehr may be used to drain the hepatic duct intermittently, or, as I prefer, two catheters may be introduced, one draining the hepatic duct, the other passing downwards into the duodenum and affording the channel by which abundant nourishment may be given.

Operations on Deeply Jaundiced Patients.

All the operations upon deeply jaundiced patients raise two questions—that of hepatic insufficiency and of its avoidance, if such be possible, by an adequate preliminary preparation of the patient, and that of post-operative hæmorrhage. The symptoms due to the failure of the liver are apt to come quite unexpectedly. The operation has perhaps presented no unusual difficulties, and the patient leaves the operation theatre in good condition. For a few days all goes well; then one of two events attract serious attention. The amount of bile discharged may suddenly diminish or almost cease; jaundice deepens slowly; the pulse becomes slower; the mind is clouded; nourishment is sparsely taken or refused, when it is well taken vomiting begins; the amount of urea in the blood steadily augments, the patient grows rapidly weaker, and dies after a period of coma. In these cases, as Walters has shown, it is renal failure consecutive to hepatic failure that causes death. Or the picture so well described by Walters and Parham may be seen.[2]

> "*Clinical Picture of Hepatic Insufficiency.*—Usually the first two to eight days after operation the course is uneventful; biliary drainage and urinary output are normal, fluids are taken well, the pulse and temperature are normal. One of the first signs of the onset of trouble is paling and thinning of the bile with marked increase in the flow. This profuse cholerrhagia does not continue long, but the bile remains thin. The patient begins to grow weaker, the pulse loses volume, and the temperature becomes subnormal. Restlessness and irritability develop with great fatigue and muscular weakness. Soon regurgitant vomiting follows intake of liquids by mouth and little taken by rectum is retained. Jaundice does not deepen markedly, but there is an increasing pallor beneath the icteric blue, the face becomes drawn, and the eyes anxious. The patient grows progressively weaker and finally dies. The urinary output remains proportional to the fluid intake throughout, and the urine reveals little or no evidence of marked nephritis. The blood-urea remains persistently low."

Post-operative hæmorrhage is due to the reduced power of coagulation of the blood, and this probably depends upon a lack of calcium salts. The deficiency of these is made good in two ways, by direct transfusion of blood, or by the intravenous administration of 5 c.cm. of a 10 per cent. solution of calcium chloride on three successive days, as advised by Walters, and by Lee and Vincent. The giving of calcium salts by the mouth even in colloid form has little effect, when, indeed, it has any, upon the calcium content of the blood. The coagulation time of the blood may be brought down to the normal or to the near neighbourhood of the normal by the intravenous administration, and the operation carried out at the appropriate moment. In all these cases it is necessary to administer as much glucose as possible by the mouth and by the rectum, and at the operation to take every care to ligature the smallest vessels. It may sometimes be prudent to postpone the removal of the gall-bladder because of the slow but unceasing weeping of blood from the denuded surface of the liver which sometimes follows upon cholecystectomy.

Secondary operations upon the biliary system are among the most difficult tasks in surgery. To obtain the best results all the highest qualities of the surgeon may be called into play: courage, resource, patience, accuracy and rapidity of judgment, the finest craftsmanship, and a tranquillity of mind and action that nothing can disturb.

STONE IN THE COMMON AND HEPATIC DUCTS.[*]

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THE presence of stones in the common and hepatic ducts is usually significant of the absence of efficient treatment in the particular patient in whom they are found. They denote failure in carrying out the only satisfactory treatment of gall-bladder disease, early cholecystectomy; this would have effectually prevented their entrance into the ducts. This failure is due to errors in diagnosis as well as inefficient treatment. Patients are still too often treated for various types of dyspepsia; that is, symptoms only are treated, and even after the onset of colic we still see attempts made to avoid operation. There is no medical treatment known at present that will remove the cause of the stone formation or dissolve those already formed; all attempts at such must fail and the ultimate death-rate far exceeds that of the curative surgical procedure. The relative number of cases operated upon at the stage when this complication has arisen must vary somewhat in every district according to the skill and bias of its practitioners and the skill and reputation of its surgeons. The percentage in Sir Berkeley Moynihan's private patients as given at Leeds last year was 21·96 (67 out of 305), differs little from mine, 18·5, which includes both hospital and private cases (113 out of 600).

It is obvious from my opening remarks that I do not believe stones form primarily in the ducts except certain rare pigment calculi associated with disease elsewhere. They may, however, increase in size and in number when infection is present and extend in a continuous column from the ampulla of Vater to the liver and even fill the intra-hepatic ducts. It follows, therefore, that if stones are found in the common duct after a previous operation for gall-stones, they must have re-formed in the gall-bladder, if this was left, or have been overlooked. This is easy unless they are systematically searched for, and even then they may be missed.

Difficulty of Pre-Operative Diagnosis.

Pre-operative diagnosis is only possible in the presence of typical attacks of colic associated with jaundice, often with rise of temperature. Jaundice is usually present at some time during the progress of the case; thus, in the 113 patients upon whom these remarks are based it had occurred in 78, but only in 33 was it severe and present at the time of operation. Many stones may be present in the common duct without producing jaundice and, on the other hand, a transient jaundice may follow an attack of biliary colic and the ducts are found at operation to be clear and the correctness of this confirmed by the subsequent history. In most instances the patient was operated upon for gall-bladder disease and the stones found in the ducts, not by accident but as a result of a definite exploration. Among the 33 cases in whom marked jaundice was present at the time of operation, in 2 it had never been associated with pain; as a distended gall-bladder could be felt the diagnosis of carcinoma of head of pancreas was arrived at. In the majority there was a history of abdominal symptoms extending over many years for which all the recognised forms of medical treatment had been tried.

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[2] Surgery, Gyn., and Obst., 1922, xxxv., 605.

[*] A contribution to a discussion on the Surgery of the Hepatic and Common Bile-ducts at the Royal Society of Medicine on June 27th, 1923.

Most of these cases were operated upon between the ages of 45 and 55, the oldest patient was 76, the youngest 23 with a three months' history. Her first symptom was a typical night attack of biliary colic followed by jaundice, and before I saw her she had had six further attacks. I removed five small calculi from her common duct. She is now 30 and has had no recurrence. It is my impression that stone is more often met with in the ducts in women, probably because of the earlier date at which men seek treatment. In my common-duct series there were 22 men. To compare with this I have taken my last 113 consecutive cases of cholecystectomy with stones in gall-bladder only; 41 were men. I do not think it is extravagant to prophesy that operations on the common duct will become rarities within the next generation of surgeons, as the students educated in the modern methods of treatment of abdominal disease go out into the world.

Treatment.

With regard to treatment, this consists in removing the stones and carrying out cholecystectomy to prevent further stone formation. I shall deal first of all with those cases, and they are the most common, in which operation is undertaken for gall-bladder disease but in which the symptoms give no indication of stones in the ducts. A shrunken gall-bladder, a dilated cystic or common duct, may at once point to its probability. In all these, and in those in whom there is a history of jaundice, after removal of the gall-bladder, the common and hepatic ducts should be explored through the stump of the cystic duct, enlarging the opening by cutting downwards if necessary and removing calculi if found. Before suturing the opening a pair of fine forceps should be passed and the ampulla dilated. The incision should be closed with a continuous stitch of hardened 00 gut and a drain left to the site of incision. This is, in my experience, the most frequent type of operation. Drainage of the ducts is imperative when infection is present or if much manipulation has been necessary in removing the stones. If calculi become impacted they do so in the ampulla, but it is rare indeed that any other approach but that mentioned is necessary for their removal. In only two have I been compelled to open the duodenum to remove such a stone, and on one occasion I mobilised the duodenum and removed an impacted calculus. All these terminated successfully. It has been a common teaching that the gall-bladder is shrunken in most cases of stone in common bile-duct; this is usually so in late cases with obstructive jaundice, but in only 44 of my series was there a small gall-bladder; in five of those with jaundice it was reduced to a fibrous cord without lumen. A dilated gall-bladder does not exclude stone in the common duct.

To pass now to the cases where stones can be palpated in the ducts. I still remove these where possible, by cutting into the common duct from the stump of the cystic. To be *certain* that the ducts are clear is impossible. On occasions, after removing with forceps and scoop what I considered were all the calculi, I have been able to syringe several others from the common and hepatic ducts. When faceted calculi or putty-like masses are found in the ducts this should always be done. Dr. W. J. Mayo[1] has told us that in nearly one-third of the deaths which followed operation on the common duct for stone, post-mortem examination revealed stones which had been overlooked. Among my cases that died at varying times after operation were five in which stones that I had overlooked or been unable to remove were found post mortem; that is, in half of those in whom this examination was done. It is instructive that in four of these the operation had been undertaken for obstructive jaundice, and I believe that had I been content with drainage only, leaving thorough search to a second operation, at least two of these lives would have been saved. In two of these the stone which I had felt in the duct could not be discovered, in two stones were removed but small calculi overlooked in the ampulla. In all, stones in the common duct were diagnosed. In only one had the common duct not been explored, a patient of 39. I removed a gall-bladder containing stones, but did not explore the common duct and have a definite note that "no stones were felt." She died of acute dilatation of the stomach the same night. Post-mortem examination revealed a small calculus in the ampulla. Had I passed a probe, as I should do now with such a history, I should have discovered it but not have prevented her death.

To pass on to the treatment of the most serious group of all, those with obstructive jaundice and usually cholangitis. I believe that it is unwise to operate in this stage unless forced so to do. I mean that the patient should be watched for a day or two, except in those cases with rigors, when immediate operation is necessary. While waiting, saline and glucose should be given per rectum. If the jaundice persists, so making operation imperative, it is well to do it in two stages; it is safer and stones are less likely to be overlooked. If the gall-bladder is distended and the cystic duct patent, cholecystotomy should be carried out; if not, temporary drainage of the common duct, with removal of such stones as present. These patients stand prolonged manipulation badly, and in this way I have been able to bring cases to a successful issue that would inevitably have been fatal if I had attempted to deal with everything in one stage. At the second operation cholecystectomy is done and the stones removed, and the ducts thoroughly examined in a way that is unwise in deeply jaundiced, ill patients.

Prognosis.

With regard to prognosis, there were 11 deaths in the 113 patients, 9 of these were among the 33 who were operated on for obstructive jaundice, and in 4 stones were overlooked. In 2 the ducts were filled with colourless fluid, the so-called white bile. Both recovered, and the excretion of bile was established within 36 hours. It is obvious how delay increases the mortality; the longer the period of jaundice the greater is the risk. In none of these cases did death result from hæmorrhage, and I have not, therefore, found it necessary to resort to pre-operative treatment by blood transfusion or the administration of calcium. Three died of lung complications, one under the anæsthetic, the remainder from the tenth to the eighteenth day from hepatic insufficiency. The two deaths among the 80 who were operated upon at a time when they were not jaundiced were due, one to acute gastric dilatation, the other to pneumonia. These figures illustrate how the risk depends on the condition of the patient with regard to jaundice and infection; cholecystectomy for stone where these are confined to the gall-bladder has a death-rate of less than 2 per cent.

What is the ultimate outlook in the patients who have had stones removed from their common ducts? The cases in which I carried out cholecystectomy and in which cholecystotomy had been performed are almost equal. In the first group, 57, there has been no recurrence of symptoms sufficiently severe to need operation and only two in which post-operative colic occurred, and in both it was within a few weeks of operation and did not recur. In one, however, a stone was overlooked and found post mortem. In those in whom the gall-bladder was left further operations were necessary in seven for removal of calculi from the common duct and in one for chronic cholecystitis. The original operation was only done by myself in one of these. The number of stones removed from cases in the first group vary, but even after the removal of hundreds—and in one case the amount was 5 oz.—no recurrence has taken place.

In conclusion, I should like to emphasise the fact that this is an entirely unnecessary complication, and that when the correct treatment for disease of the gall-bladder is carried out we shall cease to have to discuss and carry out operations for the removal of duct calculi.

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[1] The Lancet, June 30th, 1923.

LANDULAR FEVER AND INFECTIVE MONONUCLEOSIS.*

WITH AN ACCOUNT OF AN EPIDEMIC.

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LANDULAR fever is an acute, infectious, and tagious disease principally of, but not confined childhood, characterised by a rapid and marked rgement of the cervical glands, and by a less stant and less marked enlargement of the spleen, lary, inguinal, and other glands. There may be e tenderness of the cervical glands, but they are acutely painful; abdominal pain is occasionally re. The fauces are often reddened, and a tonsil y be enlarged, but the presence of exudation is sual and the changes are characteristically slight pared with the marked glandular enlargement. re is no anæmia in the acute stages. There may be hort preliminary period of malaise, the glands earing about the third day and reaching a maximum ne to three days. With the swelling of the glands re is pyrexia, which is usually about 103° F., but y reach 105° for a day or two; it rarely exceeds ° for more than a week. The prominent mass the glands usually subsides in 5 to 15 days, may relapse or, if unilateral, may occur on the osite side. Suppuration is extremely rare, and robably due to secondary infection. Glands in neck remain palpable for several weeks, or asionally for months. After the acute stage there usually a prolonged period of slight depression of lth and anæmia which needs attention. Recovery inally complete and the mortality is negligible.

he most definite complication is a hæmorrhagic hritis, usually without other manifestations of al disturbance. Its frequency in well-developed es is about 6 per cent. The parotid is not affected. condition has no relation to mumps, whooping-gh, measles, scarlet fever, or tonsillitis, or to kæmia, Hodgkin's disease, or tuberculosis, or to ctions with pyogenic organisms.

Literature of the Condition.

t was first fully described by Pfeiffer in 1889. an article which Morley and one of us (H. L. T.) lished in 1921 the bibliography up to that date l be found. In the last two years attention has been d, especially in America, to a condition of acute l transient lymphocytosis which has been described infective mononucleosis. The lymphocytosis is h relative and absolute, and many of the single nts are indistinguishable from those of the early ges of lymphoid leukæmia. Nearly all these cases e occurred in young adults. A few cases under ious titles have been recorded in previous years Türk, Cabot, Deussing, Hall, Ireland and hrah, and others. Ehrlich had met with it, a search of the older literature under such titles "acute lymphatic leukæmia with recovery," or seudo-leukæmia" would reveal many examples it. Successful cures have been claimed to depend various measures, such as the removal of a carious th, the occurrence of the lymphocytosis having n ascribed to this abnormality. Series of cases e recently been published by writers in America: unt and Evans in November, 1920, Bloedorn and ughton in 1921, and Longcope in 1922.

he highest percentage of lymphocytes which has n recorded in these series is in a case of Longcope's viz., 95 per cent., with a total count of 23,000 cocytes—a sufficiently startling occurrence. In case of Ireland and Ruhrah, published under the title A Case of Lymphatic Leukæmia with Apparent Cure, the percentage of lymphocytes was 97·5, with a total count of 20,000. This number of leucocytes has frequently been exceeded. The highest total count in our own experience is 35,000, and the highest percentage of lymphocytes is 85. The clinical manifestations in these cases are indistinguishable from the description given above of glandular fever, and the question arises of the identity of glandular fever and infective mononucleosis.

In 1921, when Morley and one of us went through the literature, no instance was found of a full blood count of a previous case diagnosed as glandular fever. In the case which was then described the lymphocytes rose to a percentage of 85, with a total count of about 15,000. This was the first demonstration of the presence of lymphocytosis associated with a clinical condition recognised as glandular fever. It was considered that the case was identical with the "infective mononucleosis" of Sprunt and Evans. A clinical condition which can be associated with such changes in the blood cells obviously requires recognition and consideration. It is certain that it is frequently overlooked, and it is probably by no means rare.

The special questions which arise are: (1) Is glandular fever a clinical entity? (2) Are glandular fever and infective mononucleosis identical? (3) The relation of these diseases to acute leukæmia and other conditions. Before discussing these questions an account will be given of an epidemic of glandular fever lately under our observation.

An Epidemic of Glandular Fever.

The outbreak occurred in a school for boys between the ages of 8 and 13 years. The school was managed on the usual lines of the best class of preparatory school. The school of 30 boys returned from the holidays on April 27th, 1921. Among the staff was a master, Mr. G., aged 23 years, whose previous movements have been traced without revealing any contact with cases suggestive of glandular fever. On May 12th his neck became visibly swollen on the left side, and the throat was sore, but there was no exudation. Constitutional symptoms were very slight. The prominent swelling subsided in a few days, but the glands remained palpable for a considerable time. Some swelling of the glands was present several days before the 12th, but the date of onset is uncertain.

Also on the same day a day boy was seen in his own home with scarlet fever; his brother (J. B., Case 13) was kept away from school. In consequence of this case of scarlet fever watch was kept in the school for any occurrence of sore throat. On the 23rd two boys reported sick with swelling of the neck and sore throat. Four more cases occurred in the next four days, the last of the six being on the 27th. The clinical condition of all the boys was similar—viz., marked enlargement of the cervical glands, little tenderness, moderate pyrexia, and slight constitutional disturbances. No rash developed. There was no tonsillitis, but in some instances the fauces were reddened. The outbreak was considered to be glandular fever.

No further cases occurred until June 5th, an interval of 9–14 days. On this and the following day 14 more cases developed. Among these was the brother of the boy with scarlet fever, who had returned to school on May 23rd, 14 days previously. Four more cases occurred subsequently, the last being on June 10th. The total number was 24, but it is probable that all the others were slightly affected. Several of the boys had had whooping-cough, mumps, scarlet fever, and measles. The clinical condition, especially in the first group, exhibited the typical manifestations of glandular fever as described above. The epidemic was mild, and constitutional disturbances were usually slight. In no instance did the temperature reach 103°, and in only three boys did it exceed 102°. There was no instance of rigors, sweats, or cough. A transient erythema localised to one flank developed in one boy who had been leaning for a long time on

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that side, but otherwise there were no rashes. There was a distinct difference in the severity of the first group and the later cases. Of the first group of six, glandular enlargement may be classified as marked in three (Cases 1 to 3), moderate in two (Cases 4 and 6), and slight in one. Of the second group of 18, as marked in two (Cases 7 and 20 in relapse), moderate in six (Cases 11 to 14, 18, and 23), and slight in 10.

Glandular Enlargement.—In all cases this was greatest in the neck. Large visible swellings were present in those classified as marked. In these the main mass was in the usual site, deep to the sterno-mastoid muscle, but other glands in the neck were also enlarged. The prominent swelling was in every case initially unilateral. In these marked cases the swelling usually occurred very rapidly, within 24 hours, and the temperature was at its maximum at the onset. In some instances there were a few preliminary days of malaise. The incidence on the right and left sides was about equal. Pain was slight and often absent, though when large a mass was usually, but not always, somewhat tender on palpation. In the less severe cases the development of the glandular enlargement was more gradual, and was equal on the two sides. Owing to the careful watch which was being kept the cases were recognised very early. In several instances glandular enlargement was very slight at first, and while under observation increased for several days. In these instances the temperature was usually normal, or indeed subnormal, when first recorded and rose with the increase in the size of the glands. The axillary glands were palpable in all the severer cases and some of the milder examples, but never formed a visible mass, and were not tender. The mesenteric glands were palpable in a considerable proportion of the slighter cases. Abdominal pain occurred in several, in one instance suggesting appendicitis. In no case was the parotid affected. In several the superficial submaxillary lymphatic gland was visibly enlarged. The mass of glands diminished rapidly in size and was rarely visible after five or six days, but glands could be recognised on palpation after several weeks. In no instance did suppuration occur, though we feared at one time that it would do so in Case 2.

Fauces.—In no instance was there any exudation on the tonsils. In a certain number the " throat " was complained of, and in these the fauces were reddened profusely and appeared dry, and in several a tonsil was definitely enlarged. In many cases the fauces were unaffected. Several of the boys had had their tonsils removed previously.

Epistaxis.—This occurred in eight cases (Cases 2, 7, 8, 14, 21, 23, 24, and in 20 during relapse). In Case 7 it was profuse and repeated, and in Cases 14 and 20 it occurred several times. It was not confined to the onset. With regard to other symptoms, constipation was not a difficulty, and there was no instance of either diarrhœa or vomiting. The spleen was palpable in only one case (Case 10); the enlargement persisted until the end of the term, but we have since found that another factor was responsible for this. There was no instance of nephritis.

Relapses.—Definite relapses occurred in two instances (Cases 1 and 20); in Case 1 the boy had been taken home for convalescence, but owing to a recurrence of glandular enlargement and pyrexia the parents sent him back on June 25th, four weeks from the onset. In Case 20 the relapse occurred on July 1st, 25 days from the onset. The initial attack was slight and the temperature did not exceed 99·5°. On July 1st the temperature rose suddenly to 102·5°, and the glands enlarged. They reached a maximum in three days, forming prominent swellings on both sides of the neck. The temperature was over 100° for nearly two weeks. In Case 14 there was a slight relapse 21 days after the onset. Until the end of the term it was found that the boys were easily tired and somewhat lethargic both in work and in games, but recovery was finally complete in every instance. Treatment was symptomatic. All the boys are now in good health, two years later.

Examination of the Blood.—There were seve difficulties in these examinations. It was necess to avoid any appearance of " experimenting " on t boys. Some of the earlier cases also were remov by the parents after a few days in order to convale

TABLE SHOWING BLOOD COUNTS OF TWENTY-ON CASES OF GLANDULAR FEVER.

Case.	Date of onset.	Date of blood count.	Leucocytes per c.mm.	Polymorphonuclear neutrophils.	Polymorphonuclear eosinophils.	Lymphocytes.
1. M. R. ..	20/5/21	29/5/21	5,100	63·5	2	31
		6/7/21	9,500	45·5	3·5	43·5
		15/7/21	8,600	48·5	4	38·5
2. J. R. ..	23/5/21	29/5/21	10,600	84	1	9·5
		6/6/21	9,600	67·5	2·5	26
		18/7/21	6,800	57·5	1	37
		23/3/23	—	65·5	3·5	28
3. S. D. ..	24/5/21	29/5/21	5,000	74·5	1	15
4. A. R. ..	25/5/21	29/5/21	13,800	28·5	2	64·5
		23/3/23	—	68	2	24
6. J. J. R.	27/5/21	29/5/21	7,800	50·5	3	43·5
		23/3/23	—	61	4	31
7. F. F. ..	5/6/21	18/6/21	8,300	52	1	37·5
8. C. K. ..	5/6/21	18/6/21	11,500	39	6	51·5
10. X. ..	6/6/21	18/6/21	4,200	44·5	3	50·5
		17/7/21	—	46	5	44
		23/3/23	—	50	2	45
12. D. N. ..	6/6/21	18/6/21	8,500	42·5	4·5	51·5
		23/3/23	—	58·5	1·5	34
13. J. B. ..	5/6/21	7/6/21	7,400	56·5	4·5	36
		23/3/23	—	53	2	41
14. G. H. ..	5/6/21	7/6/21	5,200	60·5	2·5	33·5
		19/6/21	13,500	36·5	3	56·5
		30/6/21	11,000	48·5	4·5	44·5
		15/7/21	6,600	52	3	42
15. K. H. ..	5/6/21	7/6/21	5,700	56·5	3·5	34
		19/6/21	8,600	42·5	3·5	49·5
16. C. D. ..	5/6/21	7/6/21	5,000	64·5	5	27·5
17. C. R. ..	5/6/21	18/6/21	—	44·5	5·5	44
18. M. A. ..	6/6/21	7/6/21	13,400	37·5	2·5	54
		23/3/23	—	52	1·5	43·5
19. H. P. ..	5/6/21	7/6/21	6,800	57	4	34·5
		23/3/23	—	69	1	26·5
20. R. B. ..	6/6/21	18/6/21	10,300	42	3	51
		17/7/21	7,000	50·5	0·5	46
21. J. R. ..	9/6/21	19/6/21	8,800	50	1·5	42·5
		23/3/23	—	49·5	2	43
23. T. H. ..	10/6/21	19/6/21	6,600	50·5	3·5	41·5
C. R.	10/7/21	12/7/21	18,000	26·5	3	65·5
		28/7/21	9,000	45	2	47·5
		8/4/23	—	65·5	1·5	28
C. H.	1/12/22	15/12/22	35,000	35	—	62
		20/12/22	24,000	59	—	35
		28/12/22	11,600	48·5	2	45
		15/1/23	7,800	46	3	40
		12/4/23	7,600	49·5	0·5	43

NOTE.—The numbered cases occurred in the epidemic. examinations of the blood were made in Cases 5, 9, 11, 22, and

at home. A further point was that we were unawa that the lymphocytosis may take time to develo and also that it may be very transitory; mark changes may occur in a few days. Longcope h referred to this in his article on Infective Mon nucleosis. It is evident that a single blood examin tion may not show any very distinctive change. was impracticable to take frequent counts on 24 boy and it would probably have been better to ha concentrated on a few cases. Blood counts a recorded in 19 cases. Case 10 must also be exclud as another factor was present. In the records t red blood cells and hæmoglobin are omitted; the was no appreciable degree of anæmia in any instanc The basophils have also been added to the polynucle neutrophils. In no case was their normal percenta increased and the error is negligible. In no instan was there the degree of total increase of white ce and high percentage of lymphocytes which is record in many of the sporadic cases. There is, howeve definite evidence of lymphocytosis. The great degree occurs in Case 4, who was temporarily remov by his parents a few days later, and in Case 14. It also distinct in many of the others—e.g., Cases 18, and 20. Case 14 exhibits the development lymphocytosis. Case 2 is of interest; on May 29 the mass of glands was tender, the separate glan could not be recognised, and the appearance suggest that pus would form. This was the only case i hich we suspected it. It is noteworthy that a olynuclear leucocytosis was present. Suppuration, owever, did not occur, though the glands took much nger to subside than in the others. For purposes f comparison blood films have been recently obtained om several of the boys.

M. D., aged 6 years, daughter of the practitioner in medical harge of the school, developed glandular fever on June 10th. he had not been in contact with any known case, which uggests that the infection was conveyed by her father. It ust, however, be stated that other cases were occurring in he neighbourhood, and a typical example was seen in consultation with another doctor. The daughter's attack was mild, nd she was shortly convalescent. She was then allowed to o to a garden fête on June 29th. Here, contrary to orders, he was kissed by one girl friend, C. R.; this friend alone f those at the party developed glandular fever. Malaise ommenced on July 10th, and by July 12th the cervical lands formed a prominent mass; the spleen was palpable, nd the temperature 105°. The symptoms were characeristic of glandular fever, and severer than in any case at he school. Two blood counts are given of this case, the ymphocytes reaching 66 per cent. in a total count of 18,000 eucocytes. The attack followed the usual course and ecovery was complete.

Sporadic Cases.

In addition to this epidemic eight sporadic cases ave been seen which answered to the characteristics f glandular fever. In two instances hæmorrhagic ephritis was present, which brought the patient nder observation. Several less definite cases have lso been seen. The following are notes of a recent well-marked example :—

C. H., male, aged 3 years, admitted to the Royal Northern Hospital on Dec. 11th, 1922.

History.—Measles. Family history: unimportant. Present illness: for ten days slight malaise and swelling in the right side of the neck and right groin. Passed blood in a stool on day of admission; bowels previously normal.

Condition on Admission.—Face flushed, did not appear ill, no cough, temperature 102°, pulse 118, respirations 32. On right side of neck a prominent swelling due to enlarged glands; apparently not tender on manipulation. Right submaxillary lymphatic gland also enlarged. Right tonsil enlarged, but no exudation and no difficulty in swallowing. Teeth in good order. A few glands in axilla and groin. No mesenteric glands palpable. Liver and spleen not palpable. (Dr. S. W. Harlow, the house physician, is certain that he felt the spleen one day.)

Progress of Case.—Temperature fell to 99° in six days. The prominent swelling in the neck subsided in about two weeks. The submaxillary gland diminished more slowly. Cultures from the fauces were negative for diphtheria bacilli. Recovery was finally complete.

Examination of Blood.†—It will be seen that there is a high degree of lymphocytosis, both relative and absolute (Dec. 15th). On the 20th the percentage of polynuclear cells had risen to 59 per cent., practically owing to the rapid fall in lymphocytes. Subsequently the number of polynuclear and mononuclear cells were about equal, and resembled many of the examinations in the epidemic cases.

The following case may also be recorded :—

J. K., female, aged 9 years. Chicken-pox developed on June 13th, 1922. Doing well until the 19th, when respiration became very rapid and temperature rose suddenly.

Condition on Examination.—First seen on the 20th. Temperature 104°, pulse 120, respirations 40. Looked extremely ill and distressed. Mentally clear; no cough; some cyanosis; no local pain. Became very distressed if moved. Lungs: percussion note definitely impaired at left apex and right base. Breath sounds little affected. No adventitious sounds. The condition was puzzling, but it was suggested that pneumonia was developing.

Progress of Case.—On the left side dullness extended in about 24 hours to the whole lung. Breath sounds were broncho-vesicular, never tubular. No adventitious sounds developed either here or elsewhere in lungs throughout the whole course. No sputum; spleen never palpable; no enlarged glands; fauces clear. After three or four days a slight cough developed, not paroxysmal and never troublesome. Dullness on left now cleared rapidly, at the same time becoming more extensive and definite at right base. No displacement of heart; breath sounds audible and comparatively little altered. About this time very severe abdominal pain commenced, principally in the right upper quadrant. At this stage the patient was seriously ill, the temperature remaining over 104°, pulse about 140, and respirations rising to 50. No diagnosis was suggested which fitted the symptoms and signs satisfactorily. On the sixth day the temperature began to fall slightly.

The next day a younger brother, W. K., rapidly developed a large mass of glands on the right side of the neck. The condition appeared characteristic of glandular fever, and ran the usual course. The diagnosis was then made that in the girl's case there was enlargement of the mediastinal glands with resulting pressure on the bronchi and pulmonary collapse. The abdominal pain would be consistent with the frequency of these symptoms in glandular fever. The girl made a slow but uninterrupted recovery, the symptoms gradually diminishing, and both children are now in good health.

Discussion.

(1) *Is Glandular Fever a Clinical Entity?*—The description given at the commencement of this article applies, practically without variation, to nearly all the severe cases both under our observation and in the literature. It is accurate for the severer cases in the epidemic, for M. D. and for her friend C. R., for the sporadic cases which we have seen, including C. H., for the case published by Morley and one of us in 1921, for Pfeiffer's cases, and for cases since recorded in various countries. It is also accurate for the cases recorded as "infective mononucleosis," as "acute lymphatic leukæmia with recovery," for nearly all the cases of "lymphocytosis due to sepsis," and many cases under similar titles. Atypical and milder cases certainly occur, particularly in adults, and it is noticeable that the later cases in the epidemic were milder and slower in development than the earlier ones. If, for example, we consider the case C. H., it would, we think, puzzle a sceptic to find any other recognised entity under which it could be classified. The symptom-complex is characteristic, distinct from other diseases, and in our opinion sufficient to establish glandular fever as a clinical entity. In typical cases the diagnosis in fact is simple.

(2) *Are Glandular Fever and Infective Mononucleosis Identical?*—It has been stated above that the description of symptoms, progress, and prognosis applies equally to cases recorded under these two titles. Clinically they are indistinguishable. The proof that two separate conditions exist would have to rest on typical cases in which the blood had been followed through the course without the presence of lymphocytosis. No such evidence exists at the present time. It must be noted that it is not impossible for an occasional case to show polynucleosis; this occurred in Case 2 of our epidemic in which we thought clinically that the glands would suppurate. No doubt these acutely enlarged glands may become secondarily affected with pyogenic organisms, and suppuration occasionally occurs. A single count may be deceptive, and it is difficult to know what interpretation one would have put on the blood count on Dec. 20th in the case of the male aged 3. We consider that the evidence justifies the conclusion that an absolute lymphocytosis is the normal occurrence in glandular fever, and that glandular fever and infective mononucleosis are identical.

(3) *Nature of the Mononuclear Cells.*—In nearly all our cases it was very difficult to classify many of the cells as small or large lymphocytes. The main mass of protoplasm is usually greater than is normal in small lymphocytes and stains more deeply. The nucleus is less regular, and is frequently notched and often eccentric. There are no nucleoli. A considerable number of typical lymphocytes are always present. These abnormalities in the lymphocytes have been carefully described by observers of infective mononucleosis and also by previous recorders of such cases. The descriptions are practically all similar, and apply to other cases of glandular fever which we have seen. The nucleus of the most atypical cells have some resemblance to a small-sized Rieder nucleus. It was noticeable that in Case 1 during the relapse the mononuclear cells were

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† For the examination in this case we are indebted to Dr. E. H. Shaw and Dr. P. O. Ellison. For all others we were personally responsible.

mainly typical large lymphocytes, the differential count on July 6th, 1921, being: large lymphocytes 38·5 per cent., small lymphocytes 5 per cent. In agreement with Longcope, Sprunt and Evans, and others, we consider that the cells are lymphoid in origin. These points are of interest to hæmatologists, but they are not of great importance clinically. We regard the cells as slightly immature lymphocytes. Longcope states that "the leukocytosis is dependent entirely upon an actual increase in the non-granular forms of mononuclear cells." This is almost, but not quite, invariably so. Thus in one of Longcope's cases (Case 6) there was at one time a leucocytosis of 26,200, with 60 per cent. of polynuclear neutrophils. In the case of C. H. here recorded, there were present on Dec. 15th 12,000 polynuclear neutrophils, and on Dec. 20th 14,000. It may also be noted here that a leucopenia may occur. This is mainly due to diminution of granular cells. It is not uncommon for the total leucocytes to be within normal limits.

(4) *Relation to other Diseases.*—The condition we are considering is an acute, infectious, contagious, and transient disease producing an absolute and relative lymphocytosis. From this standpoint the number of diseases we have to refer to is very limited. The numerous chronic conditions which produce only relative lymphocytosis and not an absolute increase need not be considered.

(*a*) So many of the recorded cases had previously had whooping-cough that it cannot be considered that any connexion exists. The same argument also applies to mumps, scarlet fever, and measles, though, of course, in these diseases an absolute lymphocytosis does not occur.

(*b*) There is no evidence that an acute leukæmia is infectious, and so far as we know there is no record of an epidemic. The clinical condition in glandular fever bears no relation to the grave constitutional disturbances of acute leukæmia. Recovery is complete in nearly every case. The clinical differences between the two diseases are so extreme that it is incredible that they can be due to a common factor. Differences between the leucocytes in glandular fever and acute leukæmia have been described, in close agreement, by several observers. While agreeing with these from our own observations, we doubt whether a pathologist, from consideration of these points without other information, could at present give a definite diagnosis between the two conditions, though it may become possible to do so. We may perhaps note that one form of leukæmia in fowls has been proved to be transmissible to healthy animals by inoculation.

(*c*) In infancy there is a tendency for lymphocytes to increase under simple conditions which do not have this effect in older children or in adults, but this has no relation to glandular fever.

(*d*) Certain forms of generalised neoplasm are occasionally associated with lymphocytosis. The condition is neither transient nor infectious, and obviously has no relation to glandular fever.

(*e*) With regard to septic infections, it has been stated above that the fauces are frequently reddened in glandular fever. Sometimes a tonsil may be swollen. This is the usual limit of the changes and any definite tonsillitis is rare. Not uncommonly there is no obvious change and no complaint of sore throat. There is no evidence that oral sepsis or dental caries has any connexion with glandular fever. Sepsis is frequently stated to be a rare but occasional cause of absolute lymphocytosis. In our own personal experience we have never seen an example. So far as we can ascertain this is based almost entirely on articles by Türk in 1907, by Marchand and by Cabot in 1913, and by Deussing in 1918. Study of these articles reveals no evidence for the statement. The cases of which clinical data are given can be divided into two categories—cases of acute leukæmia which were fatal, and cases of glandular fever which recovered. A striking point in these articles is the frequent absence of any evidence of sepsis. Another point is the absence of recognition that in acute leukæmia the leucocytes are frequently not increased in number. In 24 cases of acute leukæmia, which Panton and one of us (H. L. T.) published in 1914,‡ there were 11 cases in which counts of under 10,000 were recorded, and six cases of counts under 4000. Absence of recognition of this leucopenia has led many writers to attribute the leukæmia to some subsidiary septic lesion. In our opinion the statement that sepsis occasionally produces lymphocytosis is without foundation.

(5) *Nephritis.*—The amount of blood which is passed has struck most observers, especially as the usual symptoms of nephritis are certainly generally absent. The prognosis is good. It is doubtful whether a typical attack of acute nephritis ever occurs; there is no record of such an occurrence in the literature, though the condition of the urine suggests that the kidneys must sometimes be definitely affected. Little is known about this complication, which is worthy of consideration from the standpoint of nephritis.

(6) *Degree of Infectivity.*—It is difficult to arrive at a conclusion on this point. Cases have been nursed in hospital wards without special precautions, but we have never seen an instance of infection in such circumstances. It is usually stated that the incubation period is commonly seven or eight days, but the epidemic here described suggests that it is more often 10 or 12 days.

Diagnosis.

In glandular fever attention may be directed especially to the mildness of the constitutional symptoms even when the temperature is high, to the rapidity with which the glands enlarge, to the very prominent mass which they often form, and to the absence of anæmia. In one of these cases (W. K.) it is certain that the glands were not enlarged to any extent in the morning, while in the evening they formed a mass almost the size of a fist.

Acute Leukæmia.—A diagnosis is not difficult on clinical grounds. In acute leukæmia the patient is seriously ill, while in glandular fever the constitutional disturbance is nearly always mild, especially in comparison with the enlargement of the glands. An equally important point is the absence of anæmia. On the examination of the blood it would be impossible in some of the cases for a pathologist to make a definite diagnosis between leukæmia and glandular fever, but, on the other hand, it is improbable that any clinician bearing glandular fever in mind would make a mistake between the two diseases. Even apart from recollecting glandular fever, leukæmia would rarely suggest itself. The medical man who sees a case thinks not of leukæmia but of mumps or of tonsillitis. He is usually somewhat puzzled, and while he is puzzling the glands subside and the patient recovers. Sometimes he removes a carious tooth, and recovery is ascribed to this. The transient nature of the marked swelling and the usual absence of severe symptoms is the reason why the blood is so rarely examined in a condition which is comparatively common.

Mumps.—Outbreaks of glandular fever and also sporadic cases are frequently diagnosed as mumps, or perhaps even more commonly as "aberrant mumps." We have never seen the parotid gland affected in glandular fever, but the pre-auricular lymphatic gland may enlarge, and the superficial submaxillary lymphatic gland often attains a large size. The absence of pain is a practical difference. A mistake in diagnosis between these conditions would in point of fact be of little importance.

Tuberculosis.—There is no doubt that some cases of glandular fever have been diagnosed as "acute tuberculous adenitis." The serious results of such an error are obvious. The recognition of the existence of glandular fever should be sufficient to prevent a mistake which may affect an important period in a child's life. The diagnosis of "acute Hodgkin's disease" has also been made.

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‡ Quarterly Journal of Medicine.

Tonsillitis.—Septic tonsillitis is often extremely fectious. The constitutional symptoms are usually vere, suppuration is common, and there is a considerable mortality. Simple tonsillitis is, of course, ry common, and if anyone who is subject to it ntracts glandular fever there may be a co-existent nsillitis, but the striking point in glandular fever the slightness of the changes in the fauces compared ith the marked enlargement of the glands. It is bvious that the causes of local sepsis in the scalp d elsewhere must be searched for and excluded as r as possible.

Conclusions.

1. Glandular fever is a clinical entity.
2. An absolute lymphocytosis is a normal occurrence.
3. Glandular fever and the condition described as fective mononucleosis are identical.
4. Recovery is permanent, and there is no relation leukæmia, Hodgkin's disease, or tuberculosis.
5. There is no evidence that sepsis is a cause of bsolute lymphocytosis.

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TRAUMA AS A POSSIBLE CAUSE OF BRAIN TUMOUR.

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IT is a common occurrence for parents to ascribe n injury to the head as the cause for mental deficiency, pilepsy, infantile diplegia and hemiplegia, anterior oliomyelitis and other nervous affections—such njuries, which most individuals suffer from sooner or ater in greater or lesser degree, having, however, othing whatever to do with the disease in question. The only exception to this would be a true traumatic pilepsy from direct injury to the motor cortex, or vhere a blow on the head, possibly only slight, seems o be the exciting cause of starting essential epilepsy n a predisposed subject.

One is thus prejudiced against considering blows on he head as causes of cerebral disease, including erebral tumour. But cases arise from time to time vhich make one wonder whether injury to the head nay not after all be a causative factor of brain tumour. Medico-legally this point is of the greatest importance. One may "think" a head injury has caused a tumour, out legally the opinion given must be beyond "mere surmise, conjecture, or guess."

Literature of the Subject.

On looking up authorities one is surprised to find ow indefinite opinions are as a rule. Thus Gowers[1] says: "There is little doubt, however, that traumatic nfluences, falls and blows on the head, are occasionally the immediate excitants of a growth, since the symptoms have been observed to follow a blow, and the tumour is found to correspond in position to the seat of the injury. Such a relation has been observed in almost all forms of tumour, especially in syphilitic and tubercular growths and in sarcomata of the dura mater. . . . Apparently the nutritive changes consequent on a mere concussion may be the starting point of a tumour. In some cases local symptoms of irritation, which were continuous with those of a subsequent tumour, commenced two or three days after the injury. . . . But the cases in which a traumatic cause can be traced form a very small proportion of the total number and the extent of this influence may readily be overrated. It should be remembered that a fall may evoke symptoms which existed before the accident."

Ross[2] says: "Injuries of the skull act as exciting causes in the production of cerebral tumours. Several cases have come under my own observation in which the disease dated from a blow on the head, and the tumour in these cases frequently grew at a place corresponding to the seat of injury." Byrom Bramwell[3] says: "Traumatic injury is in some cases undoubtedly a proximate cause [of tumour], especially in the case of tuberculous, syphilitic, and gliomatous new growths." Van Gehuchten[4] says: "Dans certaines circonstances on tend à incriminer le traumatisme, surtout pour les gliomes et les sarcomes, mais l'influence du traumatisme sur l'éclosion des tumeurs cérébrales est loin d'être prouvée."

In considering this question I have gained much valuable information from Prof. James Ewing's book, "Neoplastic Diseases," and from it I take the following statements and references. He says:

> "There seems to be no sufficient reason for denying the relation between trauma and many chondroma, osteoma, lipoma, fibroma or fibro-myxoma with which the history of a blow is rather common—also with the most striking forms of traumatic tumour, gliosarcoma and osteosarcoma where a definite history of injury is frequent. To establish relationship several classes of evidence are necessary, as is recognised especially by French statutes: (1) The authenticity and sufficient importance of the trauma; (2) previous integrity of the part; (3) a reasonable time-relation, three weeks to three years; (4) continuity of pathological changes or symptoms in the wounded part and the appearance of the tumour; (5) microscopic proof of the existence of the tumour. When a healthy adult receives a blow on the head, remains unconscious for days, never recovers full mentality, shortly develops signs of brain tumour, and dies in a few months of gliosarcoma—the liability is generally accepted as complete."

Gerhardt gives 10 in 60 reported cases; Adler[5] in over 1000 cases gives 8·8 per cent. as due to trauma, and details 118 cases of various types, illustrating many possible relations to trauma, some of them quite direct. Trauma may be a direct exciting cause of the tumour as shown by the injury causing a lesion of the dura or pia with affection of brain tissue. Less satisfactory and more numerous are those cases in which the tumour appears at some point remote from the injury. Starr assumes, probably correctly, that a cerebral hæmorrhage or contusion may pass directly into a tumour process.

Mr. Geoffrey Jefferson, hon. surgeon to the Salford Royal Hospital, who is specially interested in neurological surgery, tells me of the following case:—

> A woman, aged 35, fell against a piece of machinery, striking the right side of the head; she ever after suffered from headaches over the vertex and then very severe in the sub-occipital region. She then commenced with occasional vomiting and sometimes to fall backwards, and her eyesight began to fail. When Mr. Jefferson first saw her six months after the injury, she could not stand without support, leaned heavily backwards, saying she was afraid she was going to fall on her face, said the room was spinning round from left to right. There was double optic neuritis and nystagmus rapid to right, slow to left; no ocular paralysis, but slight numbness of left face. A bilateral sub-occipital trephining was performed; no tumour was found, but she died the same evening from shock. At the autopsy a right-sided glioma involving the midbrain and with an extra-cerebral projection of growth which lay between the tentorium cerebelli and the upper surface of the right lobe of the cerebellum; the growth also involved the posterior part of the substance of the right hemisphere.

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[1] Diseases of Nervous System, vol. ii., p. 490.

[2] Ibid., vol. ii., p. 416.

[3] Allbutt's Syst. of Medicine, first edition, vol. vii., p. 646.

[4] Les Maladies Nerveuses, p. 467.

[5] Arch. f. Unfallheil., 1897, ii, 189.

Mr. Jefferson tells me that he has had under his care about 1000 cases of injury of the head, civil and military, and of these has only seen three cases of brain tumour. He doubts if a single trauma can start a growth and thinks it more likely that when it apparently does so it is only by "stirring up" a growth which was already present.

Personal Experience.

I regret that I cannot give definite statistics of my own, but I can certainly say that very seldom in my personal practice have I been able to ascribe brain tumour to injury. The two following cases are of interest :—

CASE 1.—In November, 1898, a finely built man, aged 46, consulted me. Three years previously he had a fall on the back of the head while skating and he was stunned for a time but not definitely unconscious. Two years afterwards he commenced with pain at the back of the head with some giddiness. In July, 1898, he found his right foot would not quite respond to his will and in August he could not write as well as usual; in September he was somewhat unsteady in gait and had acute pain at the back of the head; then found a difficulty in pronouncing words and in clear articulation. He had no vomiting.

Condition on Examination.—When I saw him he was slightly unsteady in gait and when standing with the eyes closed reeled over backwards and to the right; there was pain and some tenderness at the back of the head; the right knee-jerk was more lively than the left, and there was some slight weakness of the right arm and leg; his speech was a dysarthria (not an aphasia); pupils and optic discs were normal; no tremors; but writing very irregular, and both hands ataxic and awkward on attempting fine movements.

Course of Case.—A diagnosis of a tumour of the middle lobe of the cerebellum was made. I saw him again in ten days when he told me he had had three sudden attacks of vomiting. A few days after this he became rapidly worse with some stupor, emotionalism, and standing and talking were impossible. The late Sir William Thorburn operated on Dec. 23rd, trephining the left side sub-occipital region; the dura mater bulged greatly into the wound and was opened on Dec. 25th with a great discharge of clear fluid but no tumour was found. The patient became more sensible for a few days, then coma set in and he died on Jan. 1st, 1899.

Post Mortem.—A soft myxoglioma, the size of an average walnut, was found in the middle lobe of the cerebellum, three-fifths of it being to the right and two-fifths to the left of the middle line.

CASE 2.—On May 22nd, 1922, I was called to see in consultation a well-built, healthy-looking Jewish gentleman, aged 35, and was told that on March 24th, 1922, he had been knocked down by a motor-car and received bruises on the right hip and right side of the head; he was stunned but able with assistance to get home, only about a quarter of a mile away. After a few days rest he went to Blackpool to convalesce, but returned no better.

Condition on Examination.—When I saw him he merely complained of tingling and numbness of the left side of body and limbs with some headache. He was very nervous about his condition and very emotional, thought the right side was also getting affected, and said he was sure he was going "to have a stroke and would become lifeless." A full examination, including, of course, the optic discs, revealed no abnormal physical signs and no loss of sensation could be detected, and I considered that he was a case of traumatic neurasthenia.

Course of Case.—He returned to Blackpool and while there began to lose power on his left side. On returning home he went to the Manchester Royal Infirmary and after examination in the out-patient department was considered to be a "functional" case, but he was sent into the wards and detained there for seven weeks. During this time the left hemiplegia slowly became worse and he was taken home by his wife on August 3rd, 1922, and I was asked to see him again on that day. He was then very ill, slightly delirious, with total left hemiplegia and hemianæsthesia, immobile pupils, and double optic neuritis. On August 14th Mr. Jefferson trephined over the right motor area, there was intense bulging of the brain into the wound, but nothing definite was found. The patient died the next day.

Post Mortem.—A soft gliosarcoma was found in the right optic thalamus and invading the internal capsule. At the inquest it was considered that the tumour had no connexion with the accident, but the friends commenced a civil action which was settled out of court by the insurance company paying £550.

It is most difficult to decide whether these case really show any causal relation between trauma an tumour, or whether they are examples of tha frequent and incalculable factor in estimatin causation—namely, coincidence.

I have brought this question forward in the hop that others will make full inquiry regarding an comparatively recent injury to the head in cases o brain tumour and to elicit the experience of others.

Clinical and Laboratory Notes.

TWO CASES OF
ENCEPHALITIS LETHARGICA
WITH SCARLATINAL DESQUAMATION.

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Two cases of encephalitis lethargica under m care have both presented the feature—unusual s far as I am aware—of desquamation closely simulating that of scarlet fever.

CASE 1.—A young man, aged 17, employed as a fitter a a large omnibus garage, complained first of pain in righ knee, thought to be a sprain caused while cranking up 'bus. A week afterwards he developed acute mental symptoms, delirium and excitability, part of the delirium taking the form of "occupational soliloquies." Removed to the union infirmary as a mental case, and remained there for several days. It was then noticed that his hands were undergoing the typical "glove" peeling so characteristic of severe cases of scarlet fever. His toes also showed signs of desquamation. I was requested to see him with a view to confirming the diagnosis of scarlet fever. After some hesitation I agreed to admit him to the Wrexham Fever Hospital, as there was an indefinite history of vomiting and sore throat some weeks previously. This has since proved incorrect.

On admission, on March 2nd, 1923, to the East Denbighshire Fever Hospital, all acute mental symptoms had disappeared. He was very somnolent, waking up only when roused at meal-times, &c. Superficial and deep reflexes were present, but sluggish. There was incontinence of urine. Sane answers given to questions, but in a slow and hesitating manner. Memory very poor. Desquamation on hands complete in about a week, but contrary to what would have taken place in scarlet fever the dead skin came away in small pieces and left behind a roughish surface. No desquamation elsewhere except over a small area in the dorsal region of the back. Somnolence and lethargy lasted for two weeks, and was followed by a short period of irritability. Recovery is now almost complete, except for a certain listlessness and slurring speech. Described by his mother as having been a very bright and cheerful boy before this illness.

CASE 2.—Admitted to the Wrexham Fever Hospital on March 10th, 1923, from the Wrexham General Infirmary as a case of encephalitis lethargica. He appeared to be a fairly typical case with marked somnolence, ptosis, nystagmus and diplopia, waking up when spoken to, and answering questions in a slow monotonous voice. Quite fair appetite; reflexes normal except Babinski + in the right foot. Incontinence of urine at first, ceasing as lethargy passed off. Shortly after admission his feet, hands, and legs commenced to desquamate, not quite so markedly as in Case 1, but sufficiently so to make it a fairly typical "glove" desquamation of scarlet fever. As in Case 1, there was no peeling on the neck and chest. After peeling the palmar surface of the hands and the plantar surface of his feet presented the same rough appearance as in Case 1. This case is running a protracted course, but practically all visible skin changes have now ceased.

I have been unable to find any similar case of such marked desquamation recorded in the literature on encephalitis lethargica. In the report of Dr. A. C. Parsons to the Ministry of Health there is, however, what may be a parallel case (Case 673/1919). Here it had been noted that there was a faint rash on the chest, and this was followed by desquamation—the inference drawn being that the case was one of encephalitis lethargica combined with scarlet fever. I venture to suggest in the light of the two cases I ave had under my care that desquamation may be dded to the already manifold signs of encephalitis thargica. The close similarity of the desquama-on to that occurring in scarlet fever might deceive nyone not well acquainted with the latter disease; ut, as I have pointed out, the appearance of the kin after desquamation had taken place was ufficient to show that the peeling was not that ssociated with scarlet fever.

London.

A NOTE ON A
HELMINTH SURVEY OF A GURKHA BATTALION.

By R. C. WATTS, M.D. LIVERP., D.P.H., D.T.M.,
CAPTAIN, I.M.S.

THE original idea of the work undertaken was n investigation of ankylostomiasis among Gurkha oldiers who come from a part of India where the isease is prevalent.

Procedure.—A number of labels bearing men's ames, numbers, &c., were distributed daily amongst he Gurkha Rifles. These men were instructed to lefæcate into clean latrine pans set apart for them. After defæcation the man handed over his label to he sweeper, who took a specimen of the fæces in a allipot, labelled it, and sent it to the laboratory. n this way the whole unit was examined.

The concentration methods were not used as they ake too long, and are not practicable with restricted acilities. The ordinary method of dissolving a oopful of fæces in normal saline and putting under a over-slip was used. The results are summarised as ollows: Number of cases examined, 561; number of cases infected, 139 (ankylostomiasis, 8·5 per cent.; scariasis, 12·2 per cent.; trichocephaliasis, 4·6 er cent.).

The routine method used in the laboratory was as lescribed above, but an observation was also made s to the effect the harbouring of worms had on the uman host. The cases can be divided into three ategories: (1) Cases having infection without being nconvenienced or showing any signs whatever; 2) cases having some other diseases which may mask igns of helminthic infection; (3) cases in which næmia is marked. Though no definite figures can e given, a rough estimate under the above classes s: (1) 81 per cent., (2) 17 per cent., (3) 2 per cent.

Results.—Recruits taken by themselves showed n infection with ankylostomes in 20 per cent., but owing to good sanitary conditions in the lines ndividuals are not reinfecting themselves or infecting others. Probably this is the reason why the men with longer service show a smaller percentage of infection than the younger men. Though it is well known there are many who harbour ankylostome worms and enjoy good health, yet at some time or other the parasites may produce serious effects. For this reason treatment was carried out. Men were taken into hospital and treated with 60 gr. doses of thymol. The stools were examined for worms, which were collected for examination. It was found that all the worms were *Necator*, and that on the average three doses of thymol were required before a patient's stools were free of ova.

In conclusion, I have to thank Lieut.-Colonel H. M. Cruddas, I.M.S., for valuable suggestions.

Abbottabad, India.

QUEEN'S UNIVERSITY OF BELFAST.—The Marquis of Londonderry has been elected Chancellor of the University in succession to the Earl of Shaftesbury, resigned. The election, which rests with the Members of Convocation, was unanimous.

THE FLOWER HOUSE, CATFORD.—On Saturday, July 14th, Sir Henry Fielding Dickens, K.C., will lay the corner stone of an extension to accommodate invalid ex-officers at the Flower House, Catford, S.E. 6, when there will be a reception by Major Pat à Beckett and Major and Mrs. Walter à Beckett at 4.30 P.M.

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

SECTION OF SURGERY.

SURGERY OF THE HEPATIC AND COMMON BILE-DUCTS.

A MEETING of this section was held on June 27th, with Mr. JAMES BERRY, the President, in the chair, when Dr. WILLIAM J. MAYO opened a discussion upon this subject. Dr. Mayo's paper was published in THE LANCET last week, and the contributions of Sir BERKELEY MOYNIHAN and Mr. JAMES SHERREN, who followed, will be found on pp. 4 and 7 of our present issue.

Mr. G. GREY TURNER referred to

Cases of Surgical Injury to the Larger Bile-Ducts

which had occurred in his own practice. Case 1 was operated on for gall-stones; the gall-bladder and duodenum were wrapped in omental adhesions, during the separation of which an unsuspected diverticulum of the duodenum was opened. This was temporarily clamped and the gall-bladder, which was full of stones and apparently of hour-glass form, was removed after exposing what was thought to be the cystic duct. After the removal of the gall-bladder there was a leakage of bile, and investigation showed that the common duct had been inadvertently divided. The duodenal diverticulum, which contained a pancreatic process in its wall, was excised; as this caused considerable narrowing of the gut, the pylorus was occluded and a posterior gastro-enterostomy was performed. Investigation of the bile-duct injury then showed that at least an inch had been excised, but the ends were easily brought together and united by end-to-end suture. The patient unfortunately died of a duodenal and pancreatic fistula four weeks after operation. At the necropsy the bile-duct was found intact, although the parts were much altered by auto-digestion; other diverticula were found springing from the duodenum and upper three feet of the jejunum. Had it not been for the other complications the patient would probably have survived the injury to the bile-duct.

In Case 2 cholecystectomy was performed for gall-stones, what was taken for the cystic duct being ligatured in the usual manner. A biliary fistula appeared after operation, but this had healed on discharge from hospital three weeks after operation. After discharge the biliary fistula recurred, but healed after a month, the healing being followed by jaundice and severe pain. Four months after operation the patient, now deeply jaundiced, was readmitted, and after a few days' preparation the abdomen was reopened. After freeing the region of the biliary ducts from adhesions, the lower end of the common bile-duct, which had been divided in the first operation, was found just above the duodenum. The upper end was, after great difficulty, identified in a mass of dense scar-tissue under the liver by puncture with a hypodermic needle. During this dissection the cystic artery was injured and had to be secured by a clip, which was left in situ at the end of the operation as it was impossible to ligature the vessel. The ends of the duct were then fairly easily approximated over a rubber tube after Sullivan's method. The patient, who had stood the operation quite well, died in 48 hours from hæmorrhage into the abdominal cavity and into the cellular tissue about the hepatic omentum, duodenum, and pancreas. The junction of the bile-duct was satisfactory, but the rubber tube had been introduced too far, and had passed up the left hepatic duct to the centre of the liver. It was obvious that a mistake had been made in attempting to perform an anastomosis in the presence of deep jaundice; the indication was to open and drain the hepatic duct, and to leave the repair till a later occasion.

Case 3 was that of a stout female, aged 41, operated upon for recurrent gall-stones, cholecystectomy and gastro-enterostomy being performed. A bile fistula persisted for two weeks, and after it closed the patient became thin, developed a pale-lemon colour, and passed clay-coloured stools. Occasionally she had pain with pyrexia and definite jaundice, although in the intervals she was fairly well. A diagnosis of an increasing stricture of the common bile-duct became obvious and the biliary apparatus was explored at a second operation nearly two years after the first. The common duct was, with some difficulty, identified and opened below the obstruction, where the lumen was so narrow that a fine probe only could be passed. The stricture was divided and the duct reconstructed by a modification of Sullivan's method. Bile was discharged from the wound for a fortnight, and even when the fistula closed did not find its way into the intestine in any quantity. Three months after the operation the patient was, however, much improved; the fæces were of normal colour, but the tube had not appeared. The remarkable feature of the case was the fair health of the patient in the interval between the two operations, in spite of a severe stricture of the common duct.

Case 4, a male, aged 36, had a cholecystostomy performed as an emergency operation in February, 1922, his condition at that time precluding any more extensive operation than the removal so far as possible of stones and drainage. Although recovery followed, further attacks of gall-stone colic necessitated a further operation three months later. On this occasion cholecystectomy was performed with considerable difficulty owing to rigidity of the powerful abdominal muscles and the obscurity of the parts from adhesions. At the operation it was recognised that a small portion of the common duct had been excised; this opening was used to extract stones from the lower end of the duct and was then sutured. On the removal of the support behind the loin the parts came well together, but some bile leakage persisted for three weeks; after four weeks he was able to return home apparently cured. Shortly afterwards the wound reopened and discharged bile, and in spite of this he had pyrexia and persistent jaundice. Accordingly he was readmitted ten weeks after the last operation. After three days spent in preparation, the abdomen was again opened. There were very dense adhesions between the under surface of the liver and the situation of the bile-ducts, and the sinus had to be traced through these to the upper end of the common duct. The latter had become obliterated at the site of the injury and all the bile was finding its way through the fistula. In this case the lower end of the duct could not be identified, so the upper part was therefore anastomosed to the duodenum which had to be mobilised to allow union to be made without tension. The crescentic opening in the duodenum wall was at least half an inch in length and mucous membrane was united to mucous membrane. A small rubber drain was brought to the surface from the neighbourhood of the union. Two days after the operation there was distinct jaundice, but this soon passed off and in three weeks the patient was very well, the wound was healed, and the fæces contained a normal amount of bile. Two months afterwards he had a slight attack of pain with transient jaundice. These attacks were repeated and five months after operation he had a severe one accompanied by a rigor. This unfortunate man was accordingly readmitted in January, 1923. He was then slightly jaundiced following a recent attack. Because of the intermittent nature of the attacks and the comparatively good condition between them, the question of the possibility of further stones in the common duct was raised, and yet another operation was advised and was carried out on Feb. 3rd, 1923. The region of the duct was exposed with difficulty. No stones were felt and the duct was not dilated enough to identify or to incise. The duodenum was therefore opened and after great difficulty the new opening of the common bile-duct was found. It was very tiny, only admitting a fine probe; this was followed by bougies, until the opening easily admitted a No. 10 catheter. A portion of the latter was left in situ and fixed by a stitch. An artery was divided which could only be secured by clips left in situ. During convalescence there was slight bile leakage, pyrexia, and a tinge of jaundice. Early in June he was very well.

Points Affecting the Repair of Surgical Injuries.

These cases were quoted in order to demonstrate how much care should be exercised to avoid injury to the bile-ducts, and how, in spite of opinions to the contrary, the tendency after injury to the ducts was towards obliteration or stricture rather than towards restoration of function, even when immediate steps were taken to repair the injury. The multiplicity of operations described for the repair or reconstitution of the bile-ducts suggested that injury to them was not uncommon. Surgical injury could only be avoided by the identification of the hepatic and common ducts before the supposed cystic duct was clamped and divided. In dealing surgically with the larger bile-ducts the following facts should be borne in mind. (1) The ducts are elastic, and not only retract when divided but their ends also contract, thus favouring obliteration. (2) Except when fixed by inflammation they lie loosely among tissues which form a natural sheath in which hæmorrhage or extravasation of bile tends to be confined—the former aiding the obliterative process. (3) The mucous membrane has great recuperative power and tends to grow out along the duct, and is therefore very helpful in bridging a gap. (4) Ducts do not atrophy appreciably or become obliterated from disuse, but only as the result of inflammation. These considerations showed that the most important point in repair was to secure approximation of the ends of the ducts. The suture line should be the widest part of the duct, and too many sutures should not be employed as they were apt to cause narrowing. It was better to avoid the contact of any foreign body with the suture line. In these operations every possible aid to exposure should be employed; while the importance of the Mayo Robson position was universally recognised, the assistance given by the "reversed Trendelenburg" position was not so generally known.

Exploration of the Ducts.

He could not agree with his former master, Sir Berkeley Moynihan that it was unnecessary to open the common duct when symptoms pointed to the presence of stones, as small stones and soft detritus might easily escape detection by external palpation. When the duct was not large enough to admit the best probe, the finger, he employed the Desjardins forceps both for exploring the duct and for the removal of stones. The operation could not be considered complete, as the opener (Dr. Mayo) had taught many years ago, until a sound had been passed from the opening into the duodenum; for this purpose the speaker employed a female bladder sound three-sixteenths of an inch in diameter, thus dilating the opening of the bowel and ensuring the escape later of any stones missed during operation. The success of this manœuvre was indicated by the common occurrence of one attack of colic during convalescence. While he was interested to hear the remarks of Dr. Mayo as regards suture of the opened ducts, his own experience led him to regard drainage as the safer proceeding in any case of doubt. The greatest advances in the surgery of this region of recent years had been rather in the choice of the time for operation and in the preliminary and after-treatment than in the actual operative technique. He was convinced that the two-stage operation would save lives in the very toxic or jaundiced cases, but the need for this measure was growing less with earlier recognition of gall-stone disease and earlier operation. Mr. Turner then described a specimen, shown at the meeting, of an enormous cystic dilatation of the common bile-duct, due, he suggested, to valvular obstruction which acted in similar manner to the valvular obstruction of the ureter, producing hydronephrosis. He also suggested that the enormously dilated common ducts sometimes seen associated with only mall gall-stones, or none at all, were congenital anomalies allied to the congenital dilatation seen ometimes in the colon or ureters without any obvious cause. A further anomalous condition he had seen was the leakage of bile from apparently intact ducts sometimes associated with pancreatitis but occasionally without. Mr. Turner also suggested that the nvestigation by making plaster or gelatin casts of the lumen of the common bile-duct, to discover or disprove the presence of pouches in which stones might be overlooked, might be a useful field of study for surgical anatomists.

Reconstruction of the Ducts.

Mr. A. J. WALTON said that in these days, when so many operations were being performed in this region, t was essential that surgeons should have a clearly defined line of procedure for reconstruction of the ducts. Such an operation might be required for several conditions.

1. *Accidental Injury to the Common Bile-duct.*—Pathological lesions of the gall-bladder frequently led to changes in the anatomy of the parts which normally showed considerable variations in the origin and course of the cystic artery and in the length and position of the cystic duct. These variations, normal and pathological, unless they were well known, frequently led to injury to the common duct in the operation of cholecystectomy, which was now almost universally advocated as the operation of choice in gall-stone disease. The cystic artery might lie in front of the cystic duct; its unexpected division and retraction into the gastro-hepatic omentum led to the obscuring of the parts by hæmorrhage, and attempts to clip the vessel in the depths of the wound might easily lead to the inclusion and crushing of the common duct in the grasp of the forceps. Again, the cystic duct and the common duct sometimes ran parallel and were closely adherent; in this case both ducts might be divided, the common duct being mistaken for a portion of the cystic duct. When it was the more usual practice to remove the gall-bladder from the fundus backwards tension upon the freed gall-bladder might result in a loop of the common duct being pulled up and completely excised. As a result of inflammatory adhesions Hartmann's pouch of the gall-bladder might be firmly attached to the common duct; an incomplete dissection would then lead to the division of the common duct in mistake for the cystic. The only way to avoid these accidents was to make it a definite rule that in performing cholecystectomy nothing was divided until all three ducts, the common hepatic, the cystic, and the common bile-ducts, had been exposed by an incision in the upper part of the gastro-hepatic omentum. It was equally important that the cystic or any abnormal artery should be ligatured before it was divided.

2. *Congenital Absence of the Cystic Duct* was a very rare condition which necessarily involved removal of a portion of the common bile-duct during the operation of cholecystectomy. This should be observed and the continuity of the ducts restored at the time.

3. *Early Pancreatic Obstruction.*—In cases of this kind, when the gall-bladder was the seat of inflammatory disease or contained stones, the operator might proceed to remove the gall-bladder, failing to recognise an obstruction to the common bile-duct lower down. Later the line of suture might give way, leading to a permanent biliary fistula. At the second operation the lower portion of the duct was collapsed and might be so fibrous as to be undiscoverable; some operation would then be necessary to unite the upper patent end of the duct to the duodenum.

4. *Advanced Cases of Chronic Pancreatitis and Carcinoma of the Head of the Pancreas.*—As a rule these cases were associated with deep jaundice, a distended gall-bladder containing dark bile, and a dilated common duct as well as a hard and nodular pancreas. Rarely, however, long-continued obstruction led to absorption of the bile pigments, so that the bladder and passages were filled with mucoid-like fluid; if the gall-bladder were aspirated this condition was liable to be mistaken for obstruction to the cystic duct and the common duct might be opened to settle the diagnosis. There was then a danger of leakage from the common duct even if the opening were closed by suture and the pressure relieved by a cholecystenterostomy. A second operation to cure the biliary fistula would show an atrophied and fibrous lower end of the duct, the upper part alone being patent.

5. *Combined Disease of the Gall-bladder and Common Duct.*—It was important to realise that a growth in the bile passages might coexist with gall-stones and even with a carcinoma of the gall-bladder. In Mr. Walton's 262 cases of cholelithiasis there were seven cases of carcinoma of the gall-bladder, ten of the common duct alone, and five of carcinoma of both the common duct and gall-bladder. Carcinoma might occur at the junction of all three ducts, in the common hepatic duct above the cystic duct, in the common bile-duct, or at the ampulla. In the former two cases cholecystenterostomy would not relieve the obstruction, and in the latter two cases cholecystenterostomy would only be suitable with a healthy gall-bladder; when the gall-bladder was diseased or collapsed the only feasible operation was the anastomosis of the duct to the duodenum.

6. *Obstruction of the Duct by a Scar.*—It was stated as an objection to the routine performance of cholecystectomy that the gall-bladder was no longer available for cholecystenterostomy should the common duct become obstructed later. Such obstruction was very rare.

Operative Technique.

The operations to be performed for any one of the above conditions were numerous, and would naturally differ according to whether the duct were dilated or leaking. The operations of choice were the following.

1. *Direct Suture.*—In cases of surgical injury to one of the ducts, and sometimes when a small carcinoma had been excised, this would appear theoretically to be the operation of choice. As a matter of practice, however, direct suture was often a matter of difficulty, the ducts being small and in the case of obstruction of uneven calibre, and for this reason suture was often conducted around a tube the removal of which was again difficult. Further leakage was not uncommon and stenosis was likely to occur; the latter had occurred in a mild degree in Mr. Walton's one case of the kind.

2. *Lateral Choledochoenterostomy* might be performed in those cases where the obstruction was low down and the duct considerably dilated, the duct being anastomosed to the duodenum. The main indication for this operation was the rare condition of congenital cystic dilatation of the common duct; it might also be performed in cases of obstruction from pancreatitis or carcinoma of the pancreas where the gall-bladder was not available for cholecystenterostomy owing to disease or its previous removal. The operation was not a very satisfactory one; it caused angulation of the duct with stress on the suture line, and the opening, being large, involved a risk of the passage of duodenal contents into the duct with the consequent risk of infection of the latter.

3. *Reformation of the Common Duct* was called for when considerable segments of the duct had been excised for a growth or fibrous stricture, or for fistula resulting from surgical injury unrecognised at the time. In the latter cases the structures were much obscured by inflammatory changes, and the lower part of the duct was often practically obliterated. Attempt

had been made to form a new duct from an autogenous graft of fascia later, but these operations were difficult and a portion of the graft was likely to fail. Practically every case could be treated by either direct or indirect implantation of the upper end of the duct into the duodenum.

(*a*) *Direct Implantation*, first performed by Dr. Mayo wherever possible was the operation of choice; the upper end of the duct was brought down and anastomosed to an artificial opening in the duodenum. The opening must be so devised as to be valvular; this was accomplished in Mayo's operation by making a somewhat circular incision in the duodenum thus producing a flap-like formation, and in other cases by burying the duct obliquely in the duodenal wall for some distance. Such operations were naturally only available when the duodenum was mobile—that is, when the operation was a primary one. It would appear to be essential that the opening should be valvular to prevent an ascending cholangitis. When the duodenum was not sufficiently mobile a loop of jejunum brought through the transverse mesocolon might be employed, but such a loop was unsatisfactory by causing traction upon the anastomosis.

(*b*) *Indirect Implantation.* — Sullivan's original method was to wrap omentum round a rubber tube implanted into the duodenum at one end and into the duct at the other, in the hope that a fistulous track would be produced and the tube passed later. Such operations were often unsatisfactory. The tube, failing to be passed, might become encrusted with calculous deposit, or the fistulous track might become stenosed after the tube had been passed. These drawbacks were now overcome by using a flap cut from the anterior surface of the duodenum in place of omentum. The technique of this operation, which was described in considerable detail, was comparatively simple, and the operation was available even when large gaps had to be bridged. The new duct was valvular and was lined with duodenal mucosa accustomed to the passage of bile. The rubber tube, which was held in place by only one plain catgut suture, was usually passed within a fortnight. The flap operation could by a simple modification be employed for those cases where the common duct was dilated from obstruction by chronic pancreatitis or carcinoma of the head of the pancreas, a lateral opening being made in the duct and anastomosed by means of the flap to the duodenum.

The President remarked briefly on the extreme importance of care and a knowledge of pathological anatomy in the operation of cholecystectomy or any other operation in this region.

MEDICAL SOCIETY FOR THE STUDY OF VENEREAL DISEASES.

Metastatic Gonorrhœa.

A meeting of this Society was held at the rooms of the Medical Society of London on June 29th, Dr. F. N. **Kay Menzies** occupying the chair.

The discussion on the metastatic results of venereal disease, reported in The Lancet last week, was concluded, the subject being dealt with from the aspects of affections of the eye, the skin, the cardiovascular system, and the kidney.

Mr. **Sydney H. Browning** and Mr. **Basil Lang** dealt with

Gonococcal Affections of the Eye.

Mr. **Browning** based his contribution on his experience at Moorfields Eye Hospital during the last 14 years. Ten years ago, he said, gonococcal ophthalmia in newly-born infants was very common; to-day it was very rare, a remarkably sudden decrease occurring when, in 1920, there was extra supervision of and greater care by midwives. Most of the infants so suffering nowadays had a chemical irritation due to over-zeal, and this might be a seat of secondary infection by various pathogenic germs, conveyed, probably, by the family handkerchief. An enormous advantage in culture of the gonococcus was obtained by using Dr. P. P. Laidlaw's method of diminished oxygen tension, which he described. Vaccines he had not found of material benefit in any way to children with gonorrhœal ophthalmia. Despite appearances, patients must not be considered cured until the conjunctivæ were proved bacteriologically to be free of gonococci. In adults gonorrhœal ophthalmia usually resulted from an existing acute or subacute urethritis. Here, vaccine therapy in many cases diminished the frequency of ulceration. The urethra must be treated at the same time; and if only one eye was involved, the other must be protected. He did not know of a case in an adult in which the gonococcus had been recovered from either gonorrhœal conjunctivitis or irido-cyclitis. Pus existed in the conjunctiva in these conditions, but it had not been shown to contain organisms. They were probably toxic. As gonorrhœal iritis was a late sequel of gonorrhœa, it was not usually seen at first hand by the V.D. specialist, and it was generally treated as a purely local infection. He did not think it was set up by the presence of the gonococcus in the eye. Still, there was good reason for believing that the origin was gonorrhœal, for there was usually a history of gonorrhœa, there was a specific reaction to gonococcal vaccines, and a recurrence of the iritis followed prostatic and vesicular massage. Incidentally, he mentioned that he had neither seen nor heard of a case of gonorrhœal iritis in the female. Immediate vaccine therapy was indicated in all cases of gonorrhœal iritis, and it should be pushed to the extent of securing a considerable reaction in the eye. Detoxicated vaccines had not yielded any results in his hands.

Mr. **Basil Lang** said there were three types of metastatic infections of the eye from gonorrhœa: iritis, scleritis, and choroiditis. The first and second were uncommon from this cause, and choroiditis without scleritis quite rare. Usually a joint affection preceded any of the three. The distinguishing feature of this iritis from other forms was a clear gelatinous exudate into the anterior chamber, and the iritis was always associated with congestion of the ciliary vessels, and easily elicited tenderness over the ciliary region. The scleritis was acute in onset, and there was pain with chemosis. The choroiditis was also very sudden in onset, and the vitreous early contained many "floaters." With regard to treatment of the iritis, the pupil must be kept dilated at all costs. The atropine for this purpose was best used dissolved in castor oil, or made into an ointment with yellow vaseline. Cocaine, adrenalin, and leeches should be tried, as all blanched the eye. Leeches quickly reduced the pain. After these had been applied, the patient should bathe the eye with hot boric lotion. If heat did not benefit, cold compresses could be tried. He had never seen glaucoma produced by acute iritis. Gonorrhœal scleritis was treated on similar lines to the iritis. As to the general treatment, the patient was best in bed, and the bowels should be kept well open. Recurring iritis might be due not to the gonococcus but to a streptococcus. Sometimes an autogenous streptococcal vaccine caused a rapid cure.

Gonorrhœal Affections of the Skin.

Dr. H. G. **Adamson** dealt with the subject from the standpoint of skin diseases. He said gonococcal metastatic skin eruptions must be understood to mean eruptions produced by gonococci carried to the skin by the blood-stream. He questioned, however, the existence of such eruptions; dermatologists had little, if any, practical experience of them. The statement originated in monographs written by a German—Buschke, and a Frenchman—Perrin, in 1900, and had been copied into books ever since. Audrey, owever, a careful French observer, published a case hich deserved attention, in which erythematous atches following fever and joint pains showed points f suppuration, which coalesced into an abscess, and he pus from this contained gonococci in abundance. udrey suggested that the gonococcus should be oked for in other cases of erythema multiforme. different eruption, seen in association with gonorrhœal infection, was keratodermia blenorrhagica. his consisted of conical, horny, or translucent-looking levations, varying in size from that of a pea to an nch across, situated chiefly on hands and feet; they ight encircle the nails, and occur on the nail-beds, esulting in the nail being either raised or cast off. ometimes a peculiar balanitis was also present. In ost cases it accompanied severe gonorrhœal arthritis, ith recent urethritis. Most of these cases recovered pontaneously in the course of several months by the eparation and fall of the horny matter. In cases of undoubted keratodermia blenorrhagica frequently he patient was found to have also had psoriasis, or psoriasiform eruption. The lesions of keratodermia lenorrhagica were really heaped-up masses which ould be pulled off, leaving a smooth, glazed surface; he process was not really a hyperkeratosis, but a arakeratosis, like that in psoriasis. The question rose whether in keratodermia blenorrhagica one was ot dealing with severe psoriasis in a patient predisposed to gonorrhœa. He quoted cases which seemed o bear out this view. Possibly psoriasis might be due to a microbe related to the gonococcus.

Gonorrhœa and the Cardiovascular System.

Dr. R. A. **ROWLANDS** dealt with the subject in its relation to the cardiovascular system. He said Lacassagne, in 1872, considered that cardiac complications were very rare in gonorrhœa; but the endocardium and pericardium were attacked, particularly the latter. In 1895 Thayer and Blumer proved the existence of a gonococcal septicæmia, as well as an ulcerative endocarditis, due to the gonococcus alone. In 31 per cent. of Thayer's cases there was arthritis during the course of the illness; and in a series culled from literature it was present in 68 per cent. The symptoms were those of septicæmia. There was headache, lassitude, pain in the loin, and when of sudden onset it was ushered in with a rigor. There was also irregularly remittent or intermittent fever, associated with rigors and sweating. There was in addition rapidly developing secondary anæmia, which became more marked with the longer duration. In all cases there was a very marked leucocytosis. In two-thirds of the cases there were embolic phenomena in the skin, kidney, spleen, brain, lungs, or skeletal muscles. Renal infarction was shown in ten cases by hæmaturia, and in two cases there was a partial hemiplegia. Cutaneous hæmorrhages were present in six out of 11 cases. Acute or subacute nephritis was found in most of the cases. The average duration of the disease was nine and a half weeks, and in four cases there was a terminal mixed infection. The anatomical lesions were those of vegetative or ulcerative endocarditis. Mural endocarditis was present in eight out of 20 cases, while in four cases acute pericarditis existed. Dr. Rowlands proceeded to describe a number of cases, and gave the post-mortem findings in one or two fatal cases. It was not the rule to examine the hearts of patients when they first came suffering from gonorrhœa. A previous rheumatic endocarditis did not predispose to gonococcal disease of the endocardium, for gonorrhœa was quite as liable to attack a healthy valve.

Mr. **KENNETH WALKER** spoke on the subject in relation to the kidney. He said the gonococcus might be present unsuspected in the epididymis until a blow, by lowering the vitality of the part, enabled the activity of the organism to be revealed. Sometimes a pathologist would fail to find it on two occasions and succeed on a third, which would seem to show that the discharge of the organisms into the general circulation took place at odd times, the flooding of the blood-stream coinciding with rises of temperature. He believed the commonest portal of entry of the organisms into the blood-stream was the prostate. Gonococcal pyæmia showed a mortality, according to French authorities, of about 30 per cent. Apparently the vascular lesion was the fatal one. Considering how common was gonococcal infection of the lower urinary tract, it was surprising how seldom the kidneys were attacked. In many cases of so-called gonococcal pyelitis the trouble was found to be due to secondary organisms. Semens, in a search of the literature, was able to find only 25 cases of undoubted gonococcal infections of the kidney, and of these only 15 were purely gonococcal. A few of them seemed to be cases of an ascending infection. Gonococcal bacteriæmia seemed to be of fairly frequent occurrence. The most fatal lesion of gonococcal pyæmia was endocarditis.

Major A. T. **FROST** thought it likely that the reason very few cases of metastatic complications of gonorrhœa were seen in army practice was that special attention was paid to the prostate gland; every case was thoroughly examined, and the gland massaged; and the man was not allowed to leave the hospital until, by all the known tests, the prostate was normal. He had seen very successful results of treating keratodermia blenorrhagica by means of vaccines. That seemed to show that it was a toxæmia, especially as in that disease no one had found the organism under the skin. At Rochester Row the same good results as Mr. Browning's had not been experienced by the use of low oxygen tension. The governing factor seemed to be the hydrogen-ion concentration.

Dr. T. **ANWYL-DAVIES** spoke of a case in which, four days after marriage, the gonococcus was grown in pure culture from the cervix, which showed no sign of inflammation. The husband had acquired gonorrhœa six weeks previously. The woman attended because of an ankle lesion, which was almost suppurating. The condition cleared up under a course of vaccines. In another case repeated tests of the urethra and cervix failed to reveal gonococci in the pus, but after treatment had continued a month there was arthritis of the elbow. This was punctured, and pure gonococcus was obtained. The case cleared up with plugging and catheterisation of the uterus, and the use of vaccines.

Mr. **SYDNEY MACDONALD** said he regarded the vesicle as the chief port of entry of the gonococcus to the general system. Excising the vesicle seemed to be the only means of cutting off the source of infection; he did not think it could be drained. Sometimes sufferers from joint affections were found to have had gonorrhœa ten to 25 years previously.

Messrs. Cassell and Co., Ltd., announce the forthcoming publication of the second (revised) edition of Choyce's System of Surgery.

THE University of London Press announce the forthcoming publication of the following: "Diseases of the Breast," by Mr. Willmott H. Evans; "Daydreams; a Study in Development," by Mr. G. H. Green, B.Sc.; "The Young Delinquent," the first of three volumes on the Sub-Normal School Child, by Dr. Cyril Burt; and "Talks on Psychotherapy," being the course of lectures recently delivered at King's College, University of London, by Dr. William Brown.

DONATIONS AND BEQUESTS.—The late Mr. Thomas Arnold Cash, of Highgate and Coventry, left by will, among other bequests, £2000 upon trust to enable his brother to carry on the work for the promotion of the Humane Slaughtering of Animals, £1000 to the Model Abattoir Society, £1000 to the Coventry Society for the Prevention of Cruelty to Animals, for investment for the maintenance of a whole-time inspector for Coventry and the surrounding district; £1000 to the Coventry and North Warwickshire Hospital; and £1000 to the Birmingham Cripples' Union for the establishment or support of a branch in Coventry. On the death of his wife he left £5000 to the Corporation of the City of Coventry for a public abattoir and cattle market.—By the will of the late Mr. Johann August Diederich Bornemann, of Lincoln, the testator left among bequests £1000 to the Lincoln County Hospital and £100 to the Lincoln General Dispensary.

Reviews and Notices of Books.

A TEXT-BOOK OF PHARMACOLOGY AND THERAPEUTICS.

By E. POULSSON, Professor of Pharmacology in the University of Christiania. English edition, edited by W. E. DIXON, M.A., M.D., F.R.S., Reader in Pharmacology and Assessor to the Regius Professor of Physic, Cambridge. London: William Heinemann (Medical Books), Ltd. 1923. With 31 illustrations. Pp. 519. 25*s.*

IN no branch of medical study is the text-book so important as in pharmacology, for it is this subject which receives the least attention in the race to cover the fields of all the medical sciences, and the lecturer's opportunities of interesting the student in it are few. Writers of pharmacological works have perhaps the most fascinating of all material at their disposal, but the text-book worthy of pharmacology is yet to be produced. It will not be content to assume the form of a work of reference which only those already well grounded in physiology and pathology can usefully read, but it will give an account of the physiological and pathological processes occurring in the different systems, and then discuss the modification of function by pharmacological means. Such a book, carefully written, might be lengthy, but it would be of very great interest to the student, and of enormous value in inculcating a scientific method of approach towards all medical problems.

The scope of the standard text-books of pharmacology in current use in this and other countries is much more limited. The plan usually adopted is to take each drug separately and detail its several actions, to provide, as it were, a catalogue without much cohesion. Prof. Poulsson has not departed from this general pattern, but within its limits his text-book is a very creditable production. Already well known on the continent, it makes its first appearance in English under the trustworthy editorship of Dr. W. E. Dixon. It is essentially a book for the medical student, condensing its matter to a point mid-way between the larger text-book of Cushny and the smaller manual by Dixon, and in general presentation of the subject having considerable resemblance to both. The translation has been well done, for the sentences always run smoothly, and a reasonable balance has been maintained between the size of the volume and the size of the type. The classification followed is that of Schmiedeberg, and the various agents are taken one by one in an order permitting of easy steps, their pharmacological and clinical effects being described. As is to be expected, much of the experimental groundwork done by English workers does not appear, but in the general conclusions about the manner in which different drugs act there is an astonishing measure of agreement with current English points of view. Mention is made of some of the newer therapeutic agents, such as sodium, potassium, bismuth tartrate for syphilis and insulin for diabetes; it is perhaps a pity that a fuller account of these is not given, and that there is no discussion of other new treatments, such as the use of quinidine in heart disease. It is indeed surprising to find the statement that of the 20 different cinchona alkaloids "only quinine is of any great medicinal importance," for the value of the others in the treatment of malaria is now well authenticated.

These are small points, however, and on the whole Prof. Poulsson's manual contains sound orthodox teaching, clearly set out, and should be greatly appreciated by students of medicine.

ANALYTICAL MICROSCOPY.

By T. E. WALLIS, B.Sc., F.I.C., Ph.C. London: E. Arnold. 1923. Pp. 149. 6*s.*

Mr. T. E. Wallis's little handbook on Analytical Microscopy, although intended primarily for the analytical chemist and pharmacist, can be recommended for a place on the shelves of the medical microscopist. All too frequently he encounters in his preparations of pathological material foreign matters not easily recognisable as such. Unidentified structures of vegetable origin have before now figured as cancer parasites to the confusion of the weaker brethren. It is not too much to say that most of this nonsense would never have seen the light of day if the observers had even glanced through the extremely serviceable and well-chosen illustrations of this book. The essential addition of the magnification of every figure, which is a welcome and valuable feature, is too seldom carried out by other writers on the microscope. The directions for working methods are clear and crisp and many have a wider application than is modestly claimed for them in the preface.

HOW WE RESIST DISEASE.

An Introduction to Immunity. By JEAN BROADHURST, Ph.D., Assistant Professor of Biology, Teacher's College, Columbia University. London and Philadelphia: J. B. Lippincott Company. 1923. With 138 text figures and 4 coloured plates. Pp. 248. 10*s.* 6*d.*

THIS cheerful book is one of the publisher's series of nursing manuals. It is meant as a short introduction to immunity for those who already have some acquaintance with systematic bacteriology and is designed primarily for nurses and general science students whose course cannot include anything like the full instruction given to medical students. It is well and clearly written, abundantly illustrated, and remarkably cheap. In a short compass it gives a great deal of information, and any nurse or layman who was tolerably well acquainted with its contents would be able to talk about immunity with some facility. But whether they would know much about it is another matter. The book is quite a brilliant attempt to make the royal road. It may seem to have succeeded. But, of course, it really fails, and to pretend to any university student that he can know about immunity without sweat and tears is to cheat him of his education. As to nurses, the days are no doubt gone when Florence Nightingale said, "the strongest to the wash-tub," and if they really know all there is to be known about bed-comfort and all the arts of sympathetic kindness which have saved more lives than antisera, they will no doubt be the better for reading Dr. Broadhurst as an optional graduate course reserved for those who have learned their business. It is a book for some sisters, not for all probationers. The senior medical student who knows his Muir and Ritchie might read it with advantage; many of the points are put very well and some of the diagrams are excellent. And it can be heartily commended to practitioners who have got out of touch with modern practical serology. But as a student's manual it will not do; one might as well propose to substitute Sir Oliver Lodge's "Easy Mathematics" for Pendlebury, or Hall and Knight.

ANORMALE KINDER.

By Dr. L. SCHOLZ, Nervenarzt in Bremen. Third revised edition by Prof. Dr. ADALBERT GREGOR, Direktor der Fürsorge-erziehungsanstalt Flehingen in Baden. Berlin: S. Karger. 1922. Pp. 312. M.30.

WE reviewed the first edition of this book in 1912. Dr. Scholz fell in the war and another hand has revised and enlarged the monograph, notably in the direction of amplifying the sections on after-care and social service. According to the author, of every 200 German children three are feeble-minded, which gives a total of about 180,000 for the 12 millions of children of school age. Figures quoted from Switzerland give a percentage of 1·6, which is approximately the same. The handling of such numbers, medically and educationally, is a task calling for a body of helpers in numbers far beyond those already enlisted, and for adequate assistance from the State. A full descripion is furnished of the methods in vogue in institutions, amilies and special schools. As far as we are aware, Dr. Scholz's work has not appeared in English, yet contains much which should appeal to a wider ublic.

SPECIFIC REFLEXES.

Untersuchungen über die Eigenreflexe (*Sehnenreflexe*) *menschlicher Muskeln.* By PAUL HOFFMANN, Privatdocent für Physiologie in Wurzburg. Berlin: Julius Springer. 1922. With 38 illustrations. Pp. 106. 6*s.*

THIS little book contains in small compass much physiological information the clinical bearing of which must be of particular interest to the neurologist, who eals with reflexes daily. Dr. Hoffmann considers, ustly, that the term tendon-reflex is misleading, and he prefers to substitute for it the expression "specific eflex," meaning thereby that each muscle of the body this can obviously be demonstrated more easily in ome than in others) has its own reflex—i.e., makes its esponse to the adequate stimulus. It is unnecessary or the clinician to load text-books with tables of eflexes; he need only select one or two as of practical value. All skeletal muscles have this property in common, that if their extent is abruptly lengthened by any mechanical device they respond, provided the onus is sufficient, by a contraction, which is not a movement, but a necessary, partial, function of all voluntary movements. Its isolated appearance, as n reflex-testing, is meaningless, or, rather objectless. The specific nature of the reaction is fully investigated by Dr. Hoffmann mainly with the help of the newer methods such as the Einthoven galvanometer, and the phenomena of facilitation and inhibition are minutely described.

THE EMOTIONS.

By CARL GEORG LANGE (1834–1900), University of Copenhagen, and WILLIAM JAMES (1842–1910), Harvard University. Psychology Classics: a Series of Reprints and Translations. Edited by KNIGHT DUNLAP, Johns Hopkins University. Vol. I. Baltimore: Williams and Wilkins Company. 1922. Pp. 135. $4.

Dr. Knight Dunlap has undertaken a commendable task in editing a series of reprints and new translations of psychological classics, and the first volume will undoubtedly lay the student of psychology, philosophy, or physiology under a debt of obligation to him. It contains (1) a new version from the German text of Prof. Carl Lange's book "Ueber Gemuthsbewegungen" (1885), and (2) a reprint of Prof. James's article in *Mind* (1884), entitled "What is an Emotion?" together with the chapter on the emotions from his "Principles of Psychology." In the history of the subject the James–Lange theory has exercised a profound influence on contemporary and later workers, and while it may be that the hypothesis stands in need of revision, or of "softening," as the editor says, at any rate it should be fully understood by those who are inclined to discard it. All who are interested should make themselves familiar with the originals as now first presented in convenient and consecutive fashion.

DER BALKEN.

Eine Anatomische, Physiopathologische, und Klinische Studie. By Dr. G. MINGAZZINI, Professor of Nervous Disease in the Royal University of Rome. Berlin: Julius Springer. 1922. With 84 illustrations. Pp. 212.

Prof. Mingazzini's monograph on the corpus callosum provides a remarkably complete account, anatomical, pathological, and clinical, of the largest commissure in the brain, and embodies much valuable information gleaned from various papers scattered through the literature and not readily accessible to the student. Within recent years attention has been directed to the corpus callosum mainly from the point of view of transcortical disorders of function, such as apraxia and agnosia, and approximate localisation within it has been rendered possible by the labours of many neuropathologists. The experimentalist, also, has worked at its physiology. The monograph under review should at once find its place in the library of every neurologist, since no text-book deals with its subject-matter so adequately, nor has any previous similar contribution been so detailed or so informative.

A COMPENDIUM OF TUBERCULOSIS THERAPY.

Handbuch der gesamten Tuberkulose-Therapie. Edited by Prof. Dr. med. ERNST LOEWENSTEIN. Vienna: Urban and Schwarzenberg. 1923. In two volumes. With 32 illustrations, some coloured. Pp. 1044.

THE first part of this bulky handbook is published in two volumes, and if the second part is as bulky as the first, it would be more accurate to describe this work as a library than as a handbook. In his foreword, printed at the end of these volumes, Prof. Loewenstein states that this work is the sequel to post-graduate courses given by himself—courses which whetted the appetite of his pupils for a systematic course of published lectures by well-known authorities. The work is addressed to general practitioners, whom Prof. Loewenstein would like to see converted wholesale into tuberculosis specialists. Only thus can the campaign against tuberculosis become effective; hospitals and sanatoriums are but stations on the consumptive's long journey, and he will fare well or ill according as the long distances between these rare stations are patrolled efficiently by the general practitioner. It is customary to speak of him as the "busy" general practitioner. The many to whom this adjective applies may be more than a little alarmed by these 1044 pages, with the promise of more to come. Fortunately the subject is well classified, and thus the first qualification of a useful work of reference is guaranteed.

The editor of a work like this, to which many specialists contribute, should be a good team-driver, with a discriminating sense of proportion and balance. In this connexion it is a pity that one of Prof. Loewenstein's team of 20 has got out of hand. Nearly half of this first volume (469 pages, to be exact) is devoted to diet in tuberculosis, and it is doubtful if even the general practitioner who is not busy will find time to digest this monograph. The other contributors have kept their contributions within more modest limits, and the value of their work has certainly not suffered from their parsimony of words. Naturally many of the authors hail from Vienna, but the general editor has given a cosmopolitan flavour to his work by the inclusion of contributors from Barcelona, Philadelphia, Berlin, and Göttingen. Though the work is mainly concerned with treatment, there is plenty of pathology and even pure physics, and the chapter on the physical, chemical, and biological foundations of treatment by radiation is highly technical. There is a dry, but instructive, chapter on the statistics of tuberculosis by Prof. L. Teleky, of Düsseldorf, and a long and interesting chapter is contributed by Prof. G. Liebermeister on tuberculosis of the blood-vessels. A chapter with the intriguing title, "Statistics of Sanatorium Results," must bring disappointment to the statistician, for analysis shows that the statistical support of this form of treatment is very unreliable. The author concludes that a better estimate of the value of this treatment can be formed by the clinical study, by an expert, of a large number of cases. Another chapter is devoted to tuberculosis in relation to pregnancy, and the author, Dr. Frischbier, is in favour of inducing abortion when pulmonary disease is progressive. But he is not reckless in this direction, and he gives the very useful advice that the pregnant patient should be kept under observation for a month in a sanatorium before the fate of the fœtus is settled. In favour of inducing abortion he points out that the infant mortality in this class of case is about 70 per cent., and that inducing abortion has a favourable effect on the patient in about the same percentage. The chapter on respiratory exercises in pulmonary tuberculosis will give pause to readers who regard such exercises as the most effective method of inducing auto-inoculation.

In spite of the intrinsic merit of many of the chapters it is an open question whether such a large work, addressed to the general practitioner, does not defeat its own object.

Alfred Yarrow: His Life and Work.

By Eleanor C. Barnes (Lady Yarrow). London: Edward Arnold and Co. 1923. Pp. 328. 10*s.* 6*d.*

One of the seven wise men of Greece—namely, Solon—was of opinion that no man should be called happy while yet alive, for life is full of uncertainties. If, however, any man can be called happy while alive it is the subject of this memoir, for it is the story of a man who from small beginnings has built up a great business, has done nothing but good work, has won the affection of all who worked with him in whatever capacity, has rendered incalculable services to his country, and has accumulated a large fortune. This last item he would consider as the least of his benefits except in so far as it has enabled him to benefit his fellows in many ways, and in two particularly—namely, the Yarrow Convalescent Home for Children at Broadstairs and the gift of £25,000 towards the new out-patient room at the London Hospital. Sir Alfred Yarrow has reached his eighty-first year, and it must be with great content that he looks back over his past years. We congratulate Lady Yarrow upon her book, so simply and clearly written, giving a life-like picture of a man who was never satisfied in turning out any work but the best. How good the best was may be gathered from the records of the Yarrow destroyers during the war and also of the various classes of boats employed on the Tigris. As regards the latter operations Lady Yarrow records one delightful episode. The boats had been shipped in pieces and had to be assembled at Abadan. Mr. William Grant was in charge of the work and had to obtain workmen from all parts of the country, and consequently of varying nationalities, races, and creeds. He found that if a foreman wanted a tool, such as a hammer, he had to send two men for it, for if only one were sent "and if he were seized with a sudden desire to pray (falling on the ground for that purpose, in which devout occupation he must not be disturbed) the hammer might not appear for a considerable length of time." The British plumber is not, we imagine, hindered in getting tools which he has forgotten by "a sudden desire to pray," but it is a mark of the brotherhood of man that the same characteristics appear in the East as in the West. In relation to this matter, we may refer readers to Chapter XXX., which contains Yarrow's views on industrial problems, and is full of sound commonsense.

And here we must leave this fascinating book, but we cannot do so without wishing both its subject and its author many more years of useful happy life. Everyone will recollect the story of the Greek voter who voted against another citizen because he was tired of hearing him called "the Just." So as to spare Sir Alfred Yarrow from this fate we must recall one blot in his life's work, and that is, that so far as we can gather, he was the first to introduce steam launches on the upper Thames—a subject upon which the language of Eton and Oxford is comparable to that of the English army in Flanders in the eighteenth century. We will only add that this book ought to be in the hands of every boy, not only those who are going to be engineers, for it is a handbook to patience, perseverance, honest output, and how to spend money when it has been made.

JOURNALS.

British Journal of Children's Diseases. Vol. XX. April–June.—Mr. T. B. Layton contributes a paper on the Treatment of Acute Otitis Media in Children, in which he points out that this treatment is one which should be carried out in nearly every case by the general practitioner. The patient should be kept at rest in bed, while local treatment consists in the incision of the drumhead at the right moment. Mr. Layton maintains that it should be the aim of every practitioner never to allow a drumhead to rupture spontaneously, to look upon an inflamed ear, which under his observation has gone on untouched to the stage of discharge, as something of a disgrace to himself, just as he would consider to be so a case of acute appendicitis which in similar circumstances had gone on to acute peritonitis. As it is important that nothing should prevent a good view of the drumhead being obtained, hot fomentations, which cause the superficial epithelium to swell up and entangle any bits of cerumen, should never be used, but pain should be relieved by application of dry heat to the ear and side of the head by a hot-water bottle and pad of wool, and by the installation of antiseptic drops. The drumhead should be incised as soon as it is seen to be bulged, the incision being made deliberately under an anæsthetic. In the subsequent treatment of the case the practitioner must watch carefully for signs of mastoiditis.—Dr. F. Parkes Weber contributes a paper entitled The Nature of Banti's Disease: Its Differentiation from Other Types of Splenomegaly and its Relation to "Idiopathic" Non-Alcoholic Progressive Hepatic Cirrhosis in Children and Young Persons.—In a paper on the Classification of Blood Diseases in Childhood, Dr. Gordon Ward has drawn up a new classification founded on a mixed anatomical and pathological basis.—Dr. R. Miller reports a case of cœliac disease showing symptoms of megacolon, with autopsy, his object being, first, to establish that cœliac disease may give rise to distension of the colon sufficient to cause visible colonic peristalsis, and, secondly, to confirm his view that cœliac disease is a digestive fault, and not an organic disease.—In a paper entitled On Localised Peritonitis Due to Intestinal Perforation in Paratyphoid Fever: Report of a Case, Mr. A. E. Mortimer Woolf states that perforation in paratyphoid fever is uncommon in civil practice, though during the war hæmorrhage and perforation were almost as frequent in paratyphoid as in typhoid. When perforation occurs in typhoid or paratyphoid, general peritonitis nearly always takes place. Although there are a few instances on record of localised peritoneal abscess in typhoid fever, the writer has been unable to find any previous examples occurring in either paratyphoid A or B. The case here reported was in a boy, aged 15, who developed acute abdominal pain on the fifteenth day of an attack of paratyphoid B. At operation a perforation was found in the lower end of the ileum walled off from the general peritoneal cavity by the great omentum. The perforation was closed, and recovery was uneventful.—In a paper on the Meningeal Form of Typhus in Children, MM. Gratzosky, Stroë, and Coccias, of Bucharest, remark that typhus in children occasionally assumes a meningeal form, of which they report three examples in patients aged 2, 3, and 7 years respectively. The meningeal symptoms consisted in strabismus, inequality of the pupils, nuchal rigidity, exaggerated reflexes, and positive Kernig and Brudzinski signs. On lumbar puncture a clear cerebro-spinal fluid was obtained under hypertension, containing abundant lymphocytes with a few red cells and polymorphonuclear leucocytes. One case was fatal, and the autopsy showed meningeal infiltration and a large quantity of cerebro-spinal fluid slightly bloodstained in character. The other two children recovered in nine and ten days respectively.—The abstracts from current literature are devoted to alimentary diseases and oto-rhinolaryngology.

THE LANCET.

LONDON: SATURDAY, JULY 7, 1923.

HOUSE INFECTION.

MUCH interest has been excited by the publication of Mr. Justice McCardie's reserved judgment in the case of Collins *v.* Hopkins, the details of which are summarised on p. 34. His Lordship ruled that it was the obvious duty of a person, in whose house there has been recent infectious disease, to disinfect it in the most complete manner open to him, before letting it furnished. In his reading of the law a warranty is implied in any contract on the lessor's part that the premises are reasonably fit for habitation, including freedom from the risk of infectious disease, irrespective of whether the subject was mentioned between him and his prospective tenant or not. The law does not lay upon the lessor the obligation to consider the fads of nervous persons unreasonably afraid of infection where no danger exists. Nevertheless, if the lessor wishes to avoid trouble, he will be frank in mentioning any disease likely to cause alarm, and in giving full information as to the steps he has taken to remove any source of infection. We do not propose to comment in detail upon the many divergences in statement and in opinion which arose in the hearing of this very important case. Mr. Justice McCardie accepted as a fact that the house was left in a dirty condition, and his judgment was definitely based upon this premiss. Of course, if the house was dirty all the rest follows, for domestic dirt affords a nidus for the development of bacteria of all kinds, and no one should hand on the tenancy of dirty dwelling-rooms. We have a feeling that more might have been made by the defence of the preparations actually made for the tenant's incoming. There were no hangings but casement curtains, and these were washed; a solution of lysol was used for washing the floors; bed-clothes were sent to the laundry as well as the loose covers of furniture, and new covers were made for the cushions. But over and above this, there was the assurance on the part of the medical attendants that the case was not one with pronounced symptoms of advanced disease and that, although tubercle bacilli were present in the expectoration, the patient was sanatorium-trained, and meticulously careful in observing the instructions he received to prevent the spread of infection. The omission of notification to the local medical officer of health was indeed an unfortunate oversight, but the omission to fumigate the premises, we understand, was deliberate, in view of the care taken by the patient, and in view of the fact that he spent his time on the balcony and not in the rooms.

But although in this particular instance, and for the reasons stated, the case went against the defendant, that part of His Lordship's judgment which merits the closest attention is his statement that if the patient were properly trained as to his habits, if he carried out his medical instructions, and if full regard was paid to ventilation, sunlight, cleanliness, removal of dust and dirt, and the like, then the risk of infection might not be serious even to those who resided with him. Still less was the risk, he went on, to those who entered the house after the patient had left and if proper methods of disinfection had been adopted. We are grateful to the learned judge for thus setting out clearly the essential factors in the conveyance of infectious disease from one person to another. Only in regard to terminal disinfection would the modern hygienist place the emphasis differently. At a recent congress of the Royal Sanitary Institute, Dr. T. W. Naylor Barlow, the President-elect of the Society of Medical Officers of Health, traversed the whole notion of the potency of present methods; he went so far as to say that all house disinfection might safely be scrapped. Without denying the possibility of transmitting disease by means of inanimate objects, he regarded books, the walls of rooms, and such like, as of no account as factors in the spread of disease, logically adding that the so-called disinfection of rooms by gas is futile and unscientific. Conviction is indeed growing, not in this country alone, that the living breathing human being is the only real danger. We recently quoted the decree of the Prussian Ministry of Health, the essence of which is to organise bedside disinfection during the whole course of a patient's illness in such a way as to make a final disinfection of secondary importance or, indeed, altogether superfluous. It is perpetuation of the chronic carrier to which professional and public attention alike should be directed, and, while gaseous disinfection by formalin and sulphur fumigations may be done, this sanitary ritual should not lead to neglect of the weightier matters of the law of personal hygiene, soap and elbow-grease, sunshine and ventilation.

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THE SMALL-POX MENACE.

THE Minister of Health, in his opening statement in Committee on Supply in the House of Commons on June 28th, alluded to the present situation in regard to small-pox as distinctly serious, and regarded it as his duty to speak plainly. Whereas 20 years ago 75 per cent. of young children were vaccinated, to-day the percentage was only 38, and the country was faced with the possibility of the outbreak of a great epidemic which would be dangerous to health and even perhaps to life, besides inflicting injury upon the commerce of the country. The Ministry, he said, was watching the situation closely, and he emphasised as strongly as he could that the one sure protection against small-pox was vaccination, and that those who refused, or incited others to refuse it, were taking upon themselves a very grave responsibility. Up to June 16th 955 cases of small-pox had been brought to his notice, a number nearly as great as the total notifications of last year. Among those who had had experience of the actual disease, there had, he thought, been no doubt as to the nature of the recent cases. Although mild, the fact must not be lost sight of that the disease, which began in a mild form, might presently develop into something very much more serious. Mr. Neville Chamberlain's words may be read in our Parliamentary Intelligence column.

The situation in Gloucester is reminiscent of the early days of public health administration, before there was a general recognition on the part of the community that health was a first charge on their time and interest, a basis on which alone the fabric of civilised life could be firmly built. Something has occurred in Gloucester to interrupt the orderly course of notification, isolation, and protection of contacts which has become the token of enlightened municipal action throughout most civilised countries. Expression has been given with more or less emphasis to three different shades of thought. Some of those prominent in civic life have held that, whatever the nature of the infectious exanthem prevalent in the town, nothing should be done about it in a public way, in order not to spoil the trading facilities and other amenities of the place—a natural but not very long-sighted form of local patriotism. Another section has regarded the diagnosis of chicken-pox almost in the nature of an article of faith not amenable to disproof by ordinary scientific criteria; for a considerable number of cases notified as chicken-pox, actually 31 in the week ending June 23rd, have been rediagnosed as small-pox by medical officers of the Ministry of Health and of the Metropolitan Asylums Board, whose knowledge as experts would receive immediate acceptance in a calm atmosphere. Difficulty seems to have arisen in regard to the distinction between chicken-pox and small-pox, largely owing to insufficient stress being laid on the distribution and simultaneous appearance of the rash and too much importance on the presence of constitutional symptoms; for, as we have already noted, and are glad still to be able to note, there has, so far, not been a single fatal case this year among all the notified cases of small-pox. This admirable mildness of the disease it is which has encouraged still another local view—namely, that the disease is small-pox, but that it does not matter, the mildness being such as to render the outbreak unimportant from a public health point of view, making it therefore unnecessary to impose limitations on personal liberty in connexion with it. We are glad to think that there is no body of medical opinion included in the first and third groups which we have mentioned, and that the doubt in regard to the diagnosis is honest doubt, bred of the lack of experience in seeing actual cases of small-pox, which is the heritage of the last two generations of medical men. Dr. W. McC. WANKLYN spoke very appropriately to Guy's medical students last week on this alleged inability of the medical profession to diagnose small-pox, and he laid before them the results of the consultative system of small-pox diagnosis in London and some solid proof of what this system of diagnosis has effected. It is something for which humanity may be thankful that one of the worst of infectious plagues betrays itself early by a characteristic skin eruption which it is not—to use the phrasing of the National Health Insurance Act—beyond the ability of the practitioner of ordinary competence and skill to discover.

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THE NATIONAL PHYSICAL LABORATORY.

AT the invitation of the President of the Royal Society a large company gathered at Teddington last week to view the various departments of the National Physical Laboratory. The opportunity of seeing the research and testing departments in full working order and of meeting experts in every branch of physical science, which the occasion afforded, was widely appreciated, and the spacious department of aero-dynamics, with its huge wind tunnels, formed a pleasant setting for the reception.

Among the many branches of science flourishing at the laboratory there is, perhaps, none so interesting from the medical point of view as that of radiology. The recommendations of the X Ray and Radium Protection Committee for the better protection and general improvement of the working conditions of X ray operators have resulted in a large number of X ray materials being submitted for test to this department. A report of the work has been made by Dr. G. W. C. KAYE and Dr. E. A. OWEN. It contains interesting data concerning the protection afforded by such substances as sheet lead, lead-impregnated rubber, lead glass, and barium-sulphate plasters. The lead equivalent—that is, the thickness of lead equivalent in absorption power to unit thickness of the material—has been determined, and the figures given in the report will be of great convenience to radiologists. Of the many interesting comparisons given the following may be cited. The lead equivalent of a 12-in. solid concrete floor is about 3 mm. The masses of a steel and a lead plate which afford equal protection against X rays excited by 100,000 volts are in the ratio of 4 to 1. Different makes of lead rubber are found to differ by as much as 100 per cent. in protective value. Among the substances used for tube boxes sheet lead appears to be the lightest protective material to use, lead rubber being anything from 5 to 25 per cent. heavier. The open lead glass bowl, commonly used with X ray tubes, is criticised by the authors, who state: "In our experience, where this type of shield is alone employed, it is often possible to take a radiograph in any part of a room where a tube is working." Concurrently with this research on X ray protection the department has carried out investigations on the intensity of X rays emitted by Coolidge and gas tubes when operated by various types of high-tension generator. The work has shown that the intensity of the radiation emitted by an X ray tube is not in all cases proportional to the mean current passing through the tube, when the applied voltage is kept constant. Further, the investigators are led to state that: "Considerations of voltage and current wave-forms point to the conclusion that for a given voltage, and when the maximum current is in phase with the maximum voltage, the intensity of radiation emitted by an X ray tube, whether of the gas or of the hot cathode type, is roughly proportional to the maximum or peak current passing through the tube. This is true both for coil and transformer discharges." The radiology department is fully alive to the increasing application of higher voltages in medicine and in the study of metallic structures, as is shown by recent acquisition of a 200 kilo volt machine. Doubtless many of the problems involved in the practice of deep therapy will receive due attention at the hands of the director and his assistants. The department of sound is growing, and among the exhibits many were of medical interest—in particular an apparatus for the production of sounds of constant intensity and telephonic methods for the measurement of sound intensity. Certain workers in this field claim that variations of intensity of one million fold can be detected by the ear, and further by the use of these methods it can be demonstrated that the ear is incapable of detecting a 10 per cent. change in the intensity of sound. The research in this direction contemplated by the department will be awaited with interest, and might eventually be applicable to stethoscopy. In the multitude of routine tests which are carried out in the various sections there is evidence in all directions of the ingenuity and thought expended on the minutest details of even the simplest physical determinations. For example, in tests made upon the clinical thermometer, despite the fact that less than 2 per cent. of the number received are rejected, each thermometer is tested at four different mperatures between 95° and 110° F., its readings these points being compared with a standard ermometer. The comparison is carried out in an ectrically heated water thermostat, in which the ater is kept in very rapid circulation. After the mparison has been made for any one temperature, e water is raised in temperature a further two-tenths a degree, and readings of the thermometers are gain taken to ensure that they are responsive to ight temperature changes. At the present time bout 1200 thermometers are tested daily in this anner.

Many fascinating exhibits were displayed by the otics division. The colour effects obtained with the utting colorimeter were as pleasing as the methods r measuring the radii of curvature of microscope bjectives were ingenious. The polarimetric and ccharimetric equipment, together with the apparatus r lens testing, was particularly attractive. Though in ree fascinating hours only a small part of the ctivities of the laboratory could be witnessed, it was ossible to estimate the magnitude of the work fficiently dealt with. In the National Physical aboratory the nation has an asset of incalculable alue.

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A SPA FOR THE T.B.M.

HARROGATE is making a push to become the place f healthy resort for the tired business man, that l-defined but frequent product of our present-day ity life. With its pleasant subalpine situation and s abundant facilities for the application of the ealing virtues of waters and sunshine and fresh air, t is not unreasonable to suppose that the early stages f this real and destructive fatigue may be treated with uccess. Common experience, indeed, points in this irection, and medicine is primarily concerned with electing the appropriate cases and eliminating those n which there is already the foundation of serious rganic disease. For this Harrogate is well equipped, or it has clinical facilities which can easily be turned nto team-work and pathological facilities to detect he early stages of organic malady during a period f time devoted to rest and recreation. Nor does Harrogate cater only for those of abundant means, or, through the Royal Bath Hospital, which has a onsiderable endowment and is largely supported by he more wealthy visitors, pass every year 2000 or more patients from all parts of England, and arrangements have been made by the local medical profession or the complete examination of cases of moderate means at an inclusive fee. A new Pullman car service has been inaugurated bringing the bracing northern spa within easy reach of comfortable travel from London and, contrary to foreign practice, two-thirds of the train is put at the disposal of modest purses.

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INDEX TO "THE LANCET," VOL. I., 1923.

THE Index and Title-page to Vol. I., 1923, which was completed with the issue of June 30th, will shortly be published. A copy will be sent gratis to subscribers on receipt of a post-card addressed to the Manager of THE LANCET, 1, Bedford-street, Strand, W.C. 2.

SMALL-POX IN ENGLAND AND WALES.—During the week ending June 23rd 141 cases of small-pox were notified in England and Wales, the distribution being as follows: Derbyshire 12 (Alfreton 1, Belper 1, Heanor 4, Long Eaton 5, Clown R.D. 1); Durham 1 (Stockton-on-Tees); Gloucestershire 90 (Gloucester 79, including 31 cases notified as chicken-pox but rediagnosed as small-pox, Cheltenham 1, Stroud 2, Westbury-on-Severn 1, East Dean R.D. 4, Gloucester R.D. 3); Herefordshire 1 (Hereford); Nottinghamshire 21 (Kirkby-in-Ashfield 6, Warsop 15); Warwickshire 1 (Birmingham); Worcestershire 1 (Martley R.D.); Yorks North Riding 1 (Middlesbrough); Yorks West Riding 12 (Bentley-with-Arksay 2, Doncaster R.D. 10); Monmouthshire 1 (Risca).

Annotations.

"Ne quid nimis."

THE POSTPONED BIRTHDAY HONOURS.

LAST week-end was published the list of honours, conferred on the occasion of the King's birthday, announcement of which was postponed on account of the change in Prime Minister. A baronetcy has been conferred upon Sir Anthony Bowlby, K.C.B., K.C.M.G., K.C.V.O., President of the Royal College of Surgeons of England, and knighthoods upon Dr. George Francis Blacker, C.B.E., Dean of University College Hospital Medical School, and on Lieut.-Colonel Ewen John Maclean, chairman of the Consultative Council of the Welsh Board of Health. A Commandership of the Order of the British Empire has been conferred upon Lieut.-Colonel John Southey Bostock, R.A.M.C., Director of Medical Services of the Ministry of Pensions. To these gentlemen we offer hearty congratulations in the name of the medical profession. Other names in the list familiar to medicine are those of Sir William Plender, who has done excellent work in connexion with the National Health Insurance Act and who becomes a baronet, Mr. Walter Schroder, coroner for Central London, who becomes a Knight Commander of the British Empire, the Rev. Canon Frederick Charles Davies, vice-chairman of the Consultative Council of National Health Insurance, Mr. Walter Davies, chairman of the Manchester Hospitals Voluntary Committee, and Mr. Ernest Tom Neathercoat, President of the Pharmaceutical Society (for work in connexion with the Dangerous Drug Regulations), who become Commanders of the Order of the British Empire.

TUBERCULOSIS IN CHILDHOOD.

IN the July number of *Tubercle* there are several original articles and reviews dealing with tuberculosis in childhood. It has been said that if the problem of tuberculosis in childhood were solved, the problem of tuberculosis in the adult would practically cease to exist. In a paper by Dr. C. D. S. Agassiz and Dr. S. Roodhouse Gloyne an account is given of investigations undertaken with a view to determining whether or not the tubercle bacillus can be detected in the blood-stream in children at or about the time of the primary infection. In the cases chosen for this investigation the signs varied from those of slight involvement of the lymphatic glands to those of disease of the peritoneum or lungs. In the control cases the diagnosis of pulmonary tuberculosis was supported by extensive physical signs and the finding of tubercle bacilli in the sputum. From 1·5 to 10 c.cm. of blood were drawn from a vein, were mixed with a 1·5 per cent. solution of sodium citrate, and were in each case injected into two guinea-pigs. In no case did they develop tuberculosis, although blood obtained from these patients was drawn off both during apyrexial and pyrexial periods. It would thus appear that infection of the blood-stream by tubercle bacilli in children suffering from tuberculosis is not easily demonstrable by the method described, and the following alternative conclusions are drawn: That (*a*) the number of bacilli circulating in the blood is too small to be thus demonstrated, (*b*) they are discharged into the blood-stream only at intervals, or (*c*) extension of the disease takes place by some other route, such as the lymphatic system. A paper by Prof. P. Bull, of Christiania, contains a tale of an instructive mistake. A boy, aged 3, was supposed to be suffering from malignant disease of one testicle and metastases in the abdominal cavity. Laparotomy revealed no free peritoneal cavity; wherever he explored, Prof. Bull only found a curious greyish substance which seemed to have permeated the peritoneum, omentum, and neighbouring structures. Still thinking that the case was one of malignant disease, and therefore practically hopeless, he thrust radium tubes, without lead filters, into this greyish mass in various directions, the total dose of radium being 11 cgm. A week later the signs and symptoms of severe abdominal disease had vanished, and the child lived to die several months later of acute middle-ear disease. The necropsy showed extensive healing of tuberculosis in the peritoneal cavity and elsewhere. Among the reviews of original papers on tuberculosis in childhood there is one in which the value of a single Pirquet test is shown to be very untrustworthy. Of 800 children thus tested only 537 gave a positive reaction to the first Pirquet test with old tuberculin. Of the remaining 263 cases as many as 170, or 64·6 per cent., gave a positive tuberculin reaction either to a second Pirquet test or to the intracutaneous injection of old tuberculin in varying strengths.

FAITH AND PRACTICE.

IT is always rather difficult for a nonconformist of any complexion to understand the principles of the true faith, and when the *Homœopathic World* (No. 690, June, 1923) says that THE LANCET has "acknowledged the truth of the homœopathic principle," it is interesting to wonder to which or what principle assent has been given. Is it the original doctrine that *similia similibus curantur?* Or is it the more modern development which claims that drugs are effective in dilutions which would not contain a single molecule of the original active agent? Or is it the attribution of natures and qualities and emotions to plants which can be apprehended and used only by those in spiritual communion with the sources of drugs? It would be as difficult for the orthodox medical practitioner to draw up his creed of allopathy. Upon some of the clauses in both cases there would, we imagine, be insoluble differences of belief. But does this greatly matter when there is so much that is plain and fundamental from which no one will dissent? *In certis unitas, in dubiis libertas, in omnibus charitas.* No cult of medical men could have a better motto. And if it is followed in practice—and the more unconsciously the better—there is not much need to embark on the dangerous sea of putting down on paper what each group believes. They can all meet on the common ground of sincere humane and skilful work.

THE REGISTRATION OF DISEASE.

HOSPITAL statistics run largely to waste. This is, we think, the main lesson of a very interesting discussion on the Registration of Disease, opened by Dr. Reginald Dudfield at a meeting of the Royal Statistical Society last March,[1] and now reprinted. In his opening remarks at this discussion Dr. Dudfield pleaded for a utilisation of the records of sickness which accumulate in our general hospitals and other institutions for the treatment of disease. "It is a common experience," he said, "to read reports by different workers, dealing apparently with similar material, diametrically contradictory to each other." What is needed is the bringing together of the data derivable from all institutions, the collation and analysis of such data by a central body of statisticians who are not only statisticians but medical men of ripe judgment, well versed in the problems of public health. Other medical statisticians, Dr. T. H. C. Stevenson and Dr. Major Greenwood, and such eminent experts in public health matters as Sir William Hamer and Dr. John McVail, were in sympathy with Dr. Dudfield's general contentions. Dr. Stevenson pointed out that, even without drastic reform of the present system, some improvements might be effected. He instanced the emendation of the law required to secure knowledge of the sex and age distribution of cases of infectious disease, and suggested that a very good indication of the social class of each decedent would be afforded by a mere record of the number of rooms in the tenement occupied by the family. Dr. Greenwood dwelt upon the importance of a proper exploitation of hospital statistics, supplemented by a system of following up cases, in the study of the prognosis after operative or other treatment of malignant disease. Dr. Hamer advised Dr. Dudfield "in addition to trying to get more out of his Poor-law and health statistics" to try "to persuade the hospital authorities to introduce the study of disease as a mass phenomenon to their medical students." The medical profession as a whole will, we think, be in sympathy with Dr. Dudfield's ideas. Without doubt the economic and administrative difficulties of any centralisation of records are great, but the fact remains—and it is worth repeating and italicising—that, to a large extent, hospital experience *as a statistical datum* runs to waste. Of course, its value as such is only secondary, the highest use for hospital experience is its incorporation in the minds and practice of each generation of physicians and surgeons. But there is no opposition between these purposes. Sir William Osler could not be accused of having underrated the practical element in medical education, but, in his text-book, he employed the statistical method more fully and frequently than any other physician of his time. Dr. Dudfield's proposals would have had the full approval of that great physician.

A MILK-BORNE EPIDEMIC OF GASTRO-ENTERITIS.

A RECENT epidemic of milk-borne gastro-enteritis in Denmark has been the subject of instructive investigations by Dr. A. Christensen and Veterinary Surgeon P. Grinsted,[1] who claim that for the first time (with the possible exception of Dr. K. F. Meyer's case reported in the *Journal of Infectious Diseases* for 1916) proof positive has been found of a typical bovine paracoli infection being conveyed by cow's milk to man. The epidemic in question broke out on Oct. 11th, 1922, in a large hospital. Thirty-nine of the staff and 56 of the patients were seized with general malaise, fever, abdominal pain, nausea, headache, vomiting, and diarrhœa. In two cases there was an outbreak of herpes on the upper lip, and in one case there was partial loss of consciousness for 24 hours. None of the patients died, and no new cases occurred after the first outbreak. The incubation period was evidently very short, as was also the period during which the disease was contracted; for among the patients there was one who had been admitted to hospital for some other disease only the day before the outbreak occurred, and none of the persons admitted to hospital on the morning of the outbreak developed gastro-enteritis. All the patients had taken unboiled milk, and an inspection of the sources of the milk-supply led to the discovery that at a small farm one of the 13 cows in milk had fallen ill on Oct. 9th. Next day it had been very ill, with offensive diarrhœa and a temperature of 40° C. The cow died in the night of the 11th and 12th, but the milk yielded on the 9th had not been thrown away, although the cow's udder was œdematous. The necropsy on the cow showed definite signs of septicæmia, the spleen being gigantic and the liver and mucous lining of the small intestine showing acute inflammatory changes. Sections of the udder showed early mastitis which was evidently secondary to the enteritis and septicæmia. Numerous Gram-negative short bacilli, identified as bovine paracoli bacilli, were found in the spleen and secretion from the udder. A pure culture of the same bacilli was obtained from the fæces of two of the patients, and agglutination tests of the sera of 31 patients on the ninth to the twelfth day of the disease left little doubt as to the relation of the germs found in the cow to the epidemic in man. There is a disease in cattle known in Denmark as "paracoli bacillosis," from which calves often suffer, but to which full-grown cattle are usually immune. It may be that this comparative immunity of full-grown cattle to paracoli bacilli explains the rarity with which human ings seem to contract this form of gastro-enteritis. ut it is conceivable that this rarity is more apparent an real, and that were agglutination tests to be rried out more frequently in epidemics of this nd, bovine paracoli bacilli would often be convicted. he moral of this episode is not far to seek. Were rmers to be systematically taught the risks of eping the milk of sick cattle, they would not be mpted to follow the penny-wise-pound-foolish policy mixing infected with pure milk.

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[1] Jour. Roy. Stat. Soc., 1923, lxxxvi., 129.

[1] Hospitalstidende, April 11th and 18th, 1923.

A POST-GRADUATE COURSE ON ALPINE THERAPEUTICS.

We have received the announcement of a course of acation lectures on Tuberculosis in the Alpine limate to be held at the Research Institute in Davos om the 19th to 26th of the coming August. This astitute, in regard to which we were able to give some reliminary details last autumn, has now materialised s far as its physiological section is concerned, under he management of Prof. A. Loewy, who was for long ne of a group of collaborators with Prof. Zuntz in espiratory problems. The bacteriological section of he Institute is also ready for occupation, and it is oped to place this in the charge of an expert, when the xpected help from the Swiss Confederation comes in fter the Tuberculosis Bill has become law. At resent the joint sponsors of the Institute are the iedical associations in Davos, Arosa, and the Grisons, he Swiss Association of Naturalists, the Swiss Red ross, and the Swiss Association for Balneology and limatology. The meteorological observatory, under he direction of Prof. C. Dorno, is in close association vith the Institute, and it is therefore possible to tudy clinical problems from the varied standpoint of neteorology, physiology, and pathology. Voluntary tudentships at the Institute will be open to a certain iumber of workers. The principal items of study luring the vacation course will be the pathology of uberculosis, modern views on immune biology, general and special diagnosis with exhibition of cases, X ray and laboratory demonstrations, pneumothorax and other surgical treatment of pulmonary disease, and the application of altitude treatment to diseases other than tuberculosis, such as asthma, diabetes, and nalaria. Forenoons will be devoted to lectures and lemonstrations, while afternoons will remain free for visits and excursions. The course is free, the lectures being delivered in French or German. Board and lodging is offered at an inclusive charge of 10 francs a day to those attending the course. Further information will be given on application to the Scientific Research Institute, Davos, Switzerland.

THE AGENT PRODUCING SYMPTOMS IN EXOPHTHALMIC GOITRE.

The symptoms of exophthalmic goitre are usually attributed to the presence in the blood of an abnormal amount of the active principle of the thyroid secretion —a supposition supported by the known fact that administration of an excessive amount of thyroid substance to normal individuals is followed by symptoms which are similar to those characterising this disease. In order to ascertain whether thyroid secretion circulating in the blood is the agent producing the characteristic symptoms, certain tests have been applied by Sir E. Sharpey-Schafer[1] to the blood of persons suffering from exophthalmic goitre and to that of normal individuals as controls. The "intestinal test" depends on the fact that the addition of a small amount of extract of thyroid to Ringer's fluid in which a strip of cat intestine is suspended causes an increase both in the rhythmic movements of the strip and in its tone. The test is not very delicate, nor indeed specific, since many other substances may produce a similar action. The serum of normal blood contains a substance which produces marked augmentation and acceleration of the contractions of an isolated strip of cat's ileum; the effect of serum from cases of exophthalmic goitre is, however, far greater than that of the serum of normal blood. Thyroid extract also produces augmentation and acceleration of the contractions of the intestinal strip, but the action of thyroid extract is relatively slight compared with that even of normal serum, and the specific autacoid of the thyroid (thyroxin) has no effect in the intestinal strip. Moreover, neither normal blood nor exophthalmic blood, when fed to tadpoles, have any influence upon their metamorphoses, though thyroxin markedly accelerates the metamorphosis of frog tadpoles (tadpole test). These experiments, therefore, lend no support to the view that normal thyroid secretion containing thyroxin is poured into the blood in appreciably increased amount in exophthalmic goitre. Nor do they support the view that the symptoms of the disease are due to the presence of an abnormal amount of free adrenalin in the blood, since if this were the case, the contractions of the intestinal strip would tend to be inhibited instead of being augmented.

TWIN TUBAL PREGNANCY.

According to Mr. Leslie B. Arey,[1] of the Anatomical Laboratory, Northwestern University Medical School, Chicago, the commonest plural pregnancy which involves the uterine tubes is the combined tubo-uterine type. One hundred and nineteen cases were collected by Weibel in 1905, although probably some of them were merely presumptive and not all were twins. Plural gestation in the same tube, of which 37 genuine cases were collected by Hardouin in 1919, is next most frequent, while bilateral tubal pregnancies are rarest of all, there being less than a dozen on record. A study of the literature shows that tubal pregnancy, whether single or twin, tends to occur in women who are older by 4½ years (31·0 years) than the average age for motherhood (26·5 years). Two groups of cases may be distinguished. The first which forms three-quarters of the total consists of women who have borne children, but without recent pregnancies, and nearly one-half are multiparæ, many having had abortions. The remaining fourth consists of women who have been married a relatively long time, on an average six years, but without becoming pregnant. The explanation of this sterile interval is to be found in tubal inflammation, which is the chief factor in tubal gestation. An inflammatory process may prevent pregnancy for a variable period either by mechanically blocking fertilisation or by causing young ova to disintegrate, and on subsidence of the inflammation the tube becomes a possible nidus for the growing ovum. Rupture occurs in 58 per cent. of all cases of single tubal pregnancy. It is most frequent in tubes containing normal embryos, less common in tubes in which the embryos are pathological, and rarest in those without embryos but containing degenerated ova, so that a growing normal embryo is a special menace to the mother. Eighty per cent. of the recorded specimens of monochorionic tubal twins have ruptured, but the writer regards this figure as too high, because unruptured specimens with degenerated embryos necessarily escape recognition. The average time of rupture in single tubal pregnancy in 25 cases was at 7·7 weeks, as compared with 10·3 weeks in a series of 28 cases of twin tubal pregnancy, but it is probable that the unusual feature of twinning leads to a more representative collection of the older specimens than in single gestations, so that the later date in the twin group is not really significant. The symptoms of twin tubal pregnancy are identical with the classical picture of ordinary tubal gestation. In 9 out of 36 cases with adequate menstrual histories the embryos were of such size as to indicate that there had been one and in a few cases more than one menstrual period before pregnancy had begun. The condition has never yet been diagnosed before operation, but the writer suggests that in older cases a diagnosis might be established by X rays. The outcome of twin tubal pregnancies is recorded in 40 cases: 29 recovered, 10 died, and 1 was not recognised until the autopsy.

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[1] Quarterly Journal of Experimental Physiology, xiii., 2.

[1] Surgery, Gynecology, and Obstetrics, June, 1923.

ARE FEMALES LOSING THE ADVANTAGE OF LOW MORTALITY?

The differences in vitality of the two sexes are of perennial interest to the physician as well as to the statistician, and no completely satisfactory explanation of these differences at various ages has been advanced. Both in the United States and in this country this difference is shown even in the first year after birth. Thus in the year 1920 in the registration area of the United States the female death-rate among infants under 1 year of age was 20 per cent. and in England and Wales was 23 per cent. lower than the male infant death-rate, and an excess of male over female rate of mortality was shown consistently in each month of infancy. After infancy in the United States the excess of male over female mortality continues throughout each stage of life; while in England and Wales at ages 10–15 there is seen some excess of female over male mortality. The ages at which this excess of female over male mortality occurs in England have gradually narrowed with the course of time; and the absence of this feature in America is interesting.

In the May issue of the *Statistical Bulletin* of the Metropolitan Life Insurance Company of New York attention is drawn to the fact that in the experience of persons insured in this company a reversal of the usual relationship occurred, the female mortality at all ages exceeding the male by 2·6 per cent. in 1920, while the male excess in 1922 was 1·2 per cent. Among white insured persons an excess of female mortality over male occurred at ages 15–35 in 1920. These oscillations in the relation of male to female mortality are interesting, but their explanation is obscure. The factors producing this result are not confined to insured persons, for in 1920 taking the whole of the American registration area the death-rate at ages 20–25 and at ages 25–35 was higher in women than in men. These differences of experience in the American statistics will deserve further study, directed to a determination of the causes of excess of female over male mortality in each age-period. It is probable that similar studies of various large towns in this country would reveal exceptional sex-incidence of mortality at different ages, and that thus much light might be thrown on possibilities of preventive work. A great difficulty in pursuing this line of investigation is constituted by the delay in the issue of the census reports for a large number of counties, as without a statement of the 1921 population according to age and sex detailed death-rates cannot be calculated.

CHRONIC ECZEMA PRODUCED BY WHEAT-FLOUR.

A case of sensitisation to wheat-flour which produced chronic eczema is well reported[1] by Dr. H. Grenet and Dr. R. Clement. A woman of 63 had developed the trouble at 40; the lesion was so extensive and itched so badly as to preclude sleep, and this in spite of constant attempts at treatment. Inquiries into the family history showed nothing—no eczema that is, for the authors do not say if other types of toxic idiopathy were looked for. Finding that among the various drastic food restrictions bread seemed to be the only foodstuff which had never been curtailed, they prescribed a normal dietary, minus bread; and bread proved indeed to be the disturbing factor, for the patient improved forthwith. It is worth noting that a very definite intradermal reaction was obtained with flour mixed with normal serum, but this mixture gave no skin reaction. At this stage 100 g. of bread were deliberately administered and produced the typical blood crisis—drop of pressure in five minutes and a leucopenia reaching a maximum after 45 minutes. Desensitisation was effected with the same wheat and serum mixture; details are given in culinary terms—"one coffee-spoon of flour to two dessert-spoons of serum"; doses of half and later of 1 c.cm. of this mixture proved effective in spite of a somewhat sharp general reaction. The patient was then habituated to a bread diet by easy stages, till after three months she was allowed normal diet. Even then she was afraid to eat green peas or strawberries—foods which had previously provoked attacks of eczema; but on trial she found that these no longer harmed her. This additional success the authors ascribe to a wide group-desensitisation; and, given any specificity at all, the group must indeed be wide which includes wheat, strawberries, and green peas! We would suggest rather that, on the summation theory of protein irritants, while bread had been a constant factor making for trouble any other irritant could always produce an increase of symptoms, but with the wheat factor removed by desensitisation other and slighter irritants were not enough to cause an attack. The authors quote another less clearly established instance of wheat-eczema, and note that Sabouraud has pointed out the dangers of bread in certain cases; they conclude that such cases are commoner than is generally supposed. This may be true; but it is also true that seldom can the protein cause for eczema and asthma be established as quickly and certainly as in the case of Dr. Grenet and Dr. Clement.

BILHARZIAL APPENDICITIS.

Dr. C. H. Bailey and Dr. E. A. Bullard,[1] of Woman's Hospital, New York, who describe a case which came under their own observation, remark that though infections with the trematode parasite schistosoma are very common in certain parts of the world, especially Africa, cases in which the symptoms are confined to the vermiform appendix are extremely rare. As is well known, the commonest sites of infection by the *Schistosoma hæmatobium* described by Bilharz in 1852 are the bladder and urethra, rectum, vulva, and vagina. Urinary symptoms, especially hæmaturia, are the commonest, both in the male and in the female, in whom bilharzia infections, according to Burfield, are 24 times less frequent than in the male. The writers have been able to find only two previous cases on record in which symptoms of bilharzia infection were confined to the appendix. The first was that described by J. Burfield in The Lancet[2] in a man aged 36, in whom abundant ova of schistosoma were found in the submucosa of a suppurating appendix. The patient had no symptoms of genito-urinary or rectal involvement. The other case is one attributed to Aireton by Kelly of exclusive localisation of the ova of the parasite in the appendix, but no further description is given. The writers' case occurred in a woman, aged 25, who had lived in South Africa until she was 15. Her chief complaints were sterility, dysmenorrhœa, and frequent dull pains in the right lower quadrant of the abdomen for nearly two years. Examination showed an undeveloped uterus with stenosis of the cervix and evidence of chronic appendicitis which was confirmed by operation, when the entire meso-appendix and distal two-thirds of the appendix were found to be thickly studded with tiny greyish-white nodules resembling tubercles. Microscopical sections showed that the nodules were present in moderate number in the submucous and serous coats and throughout the meso-appendix. There were none in the mucous membrane or muscular layer. The nodules contained one or more ova with a very definite cell membrane, some of which were calcified. Numerous giant cells with many nuclei were seen djacent to or completely surrounding an ovum. n the older lesions the ovum was surrounded by dense brous tissue. Examination of the blood one month fter the operation showed a leucocytic count of 600; polymorphonuclears, 24 per cent.; small mphocytes, 52 per cent; large mononuclears, per cent.; eosinophils, 17 per cent. No ova were ound in the stools. Improvement took place under reatment by intravenous injections of sodium ntimony tartrate in 2 per cent. solution, until in ay, 1922, 14 months after the operation, the blood ount showed that the eosinophils had fallen to ·5 per cent. In the following August the patient was n excellent health and no evidence of bilharzia was ound.

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[1] Bulletins et Mémoires de la Soc. Méd. des Hôpitaux de Paris, June 7th.

[1] Surgery, Gynecology, and Obstetrics, May, 1923.

[2] The Lancet, 1906, i., 368.

LABORATORY DIAGNOSIS OF VENEREAL DISEASE.

THE first edition of the Medical Research Council's eport on the laboratory diagnosis of gonococcal infecions and methods for the detection of *Spironema allidum* is well known to all those engaged in the aboratory diagnosis of venereal disease, and the ervice which it has rendered in this field of work is ndoubted. Unfortunately, it has been unobtainable atterly, having been out of print for some months. t will, therefore, be a matter of great satisfaction to hose engaged in venereal diagnosis to know that a econd edition[1] is now available. At the important iscussion on Metastatic Gonorrhœa, the conclusion f which is reported on p. 18, doubt was thrown on he validity of some of the assumed localisations of onorrhœal infection, in the absence of actual emonstration there of the virus. The first part of he report, dealing with the laboratory diagnosis f gonococcal infections, which has been revised nd brought up to date by Dr. G. T. Western, s therefore of special value. Amongst the mprovements to be noted here is the reduction in the number of alternative media given for the cultivation of the gonococcus. The preparation of nutrient agar—which can be enriched with human plasma or serum—and of tryptamine blood-extract agar and broth is dealt with in detail and gives a sufficient choice without being excessive. A valuable addition has been made to that portion of the report by Mr. J. E. Barnard which treats with the demonstration of spirochætes by dark-ground illumination. This is a method for differentiating between *S. pallidum* and other spironemata. Briefly, this method consists in estimating the number of spirals in the spirochæte to a given length, the standard suggested being the diameter of a red blood cell. As it is not a common occurrence to find spironemata in close proximity to red cells in the preparations, an ingenious eye-piece scale has been devised which introduces a number of artificial blood cells into the field of view. The procedure is simple and the apparatus inexpensive, and it should prove of very material aid in arriving at a correct diagnosis. Revising the section which treats of the staining methods to be used for spironemata, Dr. Clifford Dobell has added some valuable advice on the use of Romanowsky stains, which will be read with advantage by those making use of this procedure. The new edition of this report should prove of even greater value than its predecessor.

THE Canadian Parliament has unanimously voted to Dr. F. G. Banting an annuity of $7500 (£1500) to enable him to carry on his scientific work.

THE Gold Medal of the Royal Society of Medicine, "awarded triennially to a scientist, man or woman, who has made valuable contributions to the science and art of medicine," has this year been awarded to Prof. F. Gowland Hopkins, F.R.S., Professor of Biochemistry in the University of Cambridge.

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[1] Medical Research Council Special Report Series, No. 19 revised). H.M. Stationery Office. Price 1s. 6d.

Modern Technique in Treatment.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

XXVII.—THE TREATMENT OF ASTHMA.

USED in its broadest sense, the term asthma is applied to a state of affairs in the smaller bronchi, which hinders the exchange of air between the larger bronchi and the alveoli of the lungs. We know little about the nature of the obstruction, but arguing from the analogy of the plain muscle of the intestine or bladder, we may assume that the bronchial muscle, which possibly contracts slightly during each normal expiration, may in asthma at one time be tonically contracted, and at another time undergoing a series of violent rhythmic contractions and relaxations. Œdema or congestion of the mucous membrane may also play a part, and is, perhaps, especially important in those cases where there is sensitisation to foreign proteins, inasmuch as the latter may produce œdema elsewhere—e.g., urticaria or angio-neurotic œdema.

From the definition given above we see that the term asthma is often used to denote a symptom, or perhaps a syndrome, rather than a disease—a syndrome in fact that may be caused by different agents. Thus in considering the treatment of asthma it is essential to diagnose the underlying cause.

(1) *Sensitisation to a Foreign Protein.*

In this case the asthma may be associated with other symptoms, such as coryza, gastro-intestinal disturbances, urticaria, angio-neurotic œdema, eczema, or acute dermatitis. Hay fever due to grass pollen is the commonest variety, but there are also the animal asthmas, where the hairs or feathers are responsible, and sensitiveness to certain foods or beverages, such as cereals, eggs, potatoes, lobster, strawberries, cocoa, &c. These foods usually produce gastro-intestinal disturbances in susceptible people, but asthma may occur as well. Finally, there may be a sensitiveness to micro-organisms of the respiratory or alimentary tracts, or to certain drugs. In some cases the diagnosis follows from the history of the case. But in any case, testing may be carried out with a series of proteins, which can be obtained commercially. The skin after cleaning is slightly scarified, and the solution of the protein applied by means of a platinum loop. If the protein is in powder form, it may be added to a drop of N/10 sodium hydrate, which has been placed over the scarified area. An urticarial wheal of at least ¼ inch in diameter indicates a positive result. Single protein testing, though it gives more satisfactory results, is a rather tedious business, and can be made shorter by the combination of various allied proteins—e.g., cat's, dog's, and horse's hair into a group, with various feathers, so that a single test answers for several different proteins. Some workers in this country and America have found that as many as 50 per cent. of asthmatics are sensitive to some foreign protein; but usually the positive results are much fewer than this. Sometimes patients rather disconcertingly react once and fail to react next time.

If a particular protein is answerable the best treatment is to avoid its presence altogether. Hay fever patients should stay in town in the early summer, or use a thick veil when walking in the country. Articles of diet containing the specific substance should not be eaten. If prevention is unsuccessful, desensitisation may be carried out by means of hypodermic injections of the specific protein in gradually increasing doses. Oral administration has also been carried out, particularly in France. These various antigens may be obtained commercially. Sensitiveness in hay fever may be tested by subcutaneous injections or by dropping solutions, gradually increasing in strength, of a mixture of pollen extracts into the eye, and after a few minutes examining for slight signs of inflammation. When a reaction is obtained, desensitisation may be carried out by injecting 1 c.cm. of a solution slightly weaker than that which caused the ophthalmic reaction, and repeating this every three or four days. The ophthalmic reaction may be re-determined at intervals, and the amount of the injections regulated accordingly. Hydrated calcium chloride in doses of 15 gr. dissolved in water three times a day may be of value in the prevention of hay fever.

(2) *Idiopathic Asthma.*

In the same way that certain people seem to be affected with an irritable stomach, so we must imagine that a peculiarly sensitive neuro-muscular mechanism in the smaller bronchi is responsible for this group of asthma cases. In such people reflex disturbances in other parts of the body, hidden infection, and emotions may cause attacks. The attack may come on merely because the patient expects it; much good may be done by encouraging him to fight against this kind of suggestion. Worry, excessive physical or mental strain—e.g., sitting for examinations or overwork—must be avoided. If possible, a climate and surroundings should be chosen that suit the patient. The bowels must be made to act regularly; daily exercise should be taken in the fresh air; holidays should be regular. Indigestible food must be avoided, particularly at night.

Sources of infection must be eradicated, especially carious teeth showing apical infection. Dental X ray films may be of great value in diagnosis. The tonsils must be examined for disease and removed if heavily infected. Autogenous vaccines may be used. Care must be taken that children are not mouth-breathers, and, if so, simple respiratory exercises, such as deep inspirations through the nose, should be practised three or four times a day. It may be necessary to remove adenoids. In previous years various operations on the nose have had considerable vogue in the treatment of asthma, but they are now less popular.

Of recent years non-specific protein therapy has been used for asthma. The successful results obtained with stock vaccines made up from catarrhal organisms or mixed strains of *B. coli* are probably not due to their specificity against particular organisms present in the naso-pharynx or bronchi of the individual; they act because they contain foreign proteins. Peptone injections are often used for the same reason. Auld[1] advises a 5 per cent. solution of Armour's No. 2 peptone injected intramuscularly or intravenously. The first dose is 0·3 c.cm., and is gradually increased by 0·2 c.cm., the maximum dose being 2 or 2·5 c.cm. Injections are given twice weekly. The maximum dose advisable is one that just fails to give a reaction, and the temperature should be taken four or five hours after the injection, to see whether it is raised. Peptone is also given orally. Liquor arsenicalis in 5-minim doses, bromides, and particularly potassium iodide in doses up to 30 gr. a day are the most valuable drugs to prevent the onset of attacks. Mild purgation with calomel in small doses is also of value, and salol and other intestinal disinfectants have been used.

(3) *Asthma due to Infection of the Respiratory Tract.*

Asthma is often secondary to acute or chronic catarrhal infection of the upper respiratory tract, so that if the latter can be prevented or arrested, the attacks of asthma will cease. The treatment devised by Mr. Wilfrid Glegg of Birmingham is of the greatest value for naso-pharyngeal infection, and should always be tried before more elaborate means are adopted. The following is a simple way of carrying it out. A nasal funnel (these are made for me by Down Bros.) is filled with a mixture of 1 part white vaseline and 3 or 4 parts of liquid paraffin. This is allowed to run down each nostril in turn with the patient in a recumbent position, until it is felt in the naso-pharynx, when it may be swallowed. This process is carried out night and morning in chronic infection, but should be repeated 4-hourly to prevent the onset of an acute coryza, as soon as the first symptoms are noticed. It is not always possible to prevent altogether the onset of some tracheitis and bronchitis, but in my experience they are less severe than if the naso-pharyngeal infection had run its usual course.

Autogenous vaccines may be prepared from the sputum, or from swabs passed through the anterior nares into the naso-pharynx or from the naso-pharynx directly. Immediate planting out and incubation of the material is advisable. Stock vaccines may be employed, and these bacterial infections may yield to non-specific protein therapy as already described. In the chronic bronchitis and asthma so common in elderly people, many of the drugs detailed below may be used, but in addition expectorants will be useful for the bronchitis, and it may be necessary to treat incipient cardiac failure. Asthma may be present with phthisis, and treatment of the phthisis may relieve the asthma.

(4) *Treatment of an Asthmatic Attack.*

A large number of drugs have been successful in cutting short an attack of asthma or in relieving the difficulty of breathing that persists after the climax of the attack is over. A subcutaneous injection of 1 or 2 ♏ of adrenin (1 in 1000) may answer, though 10 or even 15 ♏ have been injected intramuscularly. Recently, benzyl benzoate has been administered in 20-drop doses 4-hourly, by the mouth or subcutaneously. Maximal pharmacopœial doses of tr. lobeliæ æth., tr. stramonii, tr. belladonnæ, choral hydrate, the nitrites, or nitro-glycerine may be given by mouth. Inhalation of amyl nitrite, chloroform, or the fumes made by igniting the B.P.C. mixture of potassium nitrate, lobelia, stramonium leaves, and anise fruit in equal parts, are often used during the acute attack, and cigarettes containing stramonium are smoked; but a warning must be sounded in regard to the frequent inhalation of fumes, as they irritate the bronchi, causing inflammation, and this predisposes to future attacks. Injections of atropine gr. 1/100 to 1/50 may be of value, but morphia, although very effective, must not be used if the attacks are frequently repeated, and the same applies to sprays containing cocaine.

Great relief will be experienced with oxygen inhalation, which, to be effective, must be given by means of a mask, such as that supplied with Haldane's apparatus (an anæsthetic mask will answer satisfactorily) or by means of a nasal catheter pushed right back into the naso-pharynx. The secret of successful oxygen treatment is to give it in sufficient quantity. It may be bubbled through water, so quickly that the bubbles cannot be counted. The flow must be at least 2 litres a minute to begin with, and if there is no gauge on the cylinder, it is a simple matter to test the rate by delivering the oxygen through a rubber tube beneath a pint measure which has been filled with water and inverted in a basin of water. The flow should be quick enough to displace the water in from 15 to 20 seconds. Attacks may also be stopped by hot baths, particularly if the patient inspires cool air from an inhaler which has been packed with ice.

(5) *Breathless Attacks in Elderly Subjects.*

Many elderly people are prone to attacks of breathlessness, particularly at night-time. The heart not uncommonly shows some evidence of failure, and the patients also notice that they soon get out of breath with exercise. There is emphysema and the breathing at times may become periodic, somewhat resembling Cheyne-Stokes respiration. Such cases have been called cardiac asthma. There may be some albuminuria, but although the urea in the blood is perhaps a little raised, there is no increase of fixed acid, and so these cases are not uræmic. Their pathology is rather obscure, but some recent evidence[2] points to the breathless attacks being due to bronchial spasm. Antispasmodic remedies may be of some value, but oxygen is the chief stand-by. Here again it is important to use a comparatively rapid flow, and administer it through a mask and valves, or nasal catheter. The wasteful and ineffective glass funnel should not be used.

E. P. Poulton, M.D. Oxf., F.R.C.P. Lond.,
Physician to Guy's Hospital.

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[1] The Lancet, 1921, i., 698.

[2] Campbell, Hunt, Poulton: Jour. Path. Bact., 1923, xxvi., 234.

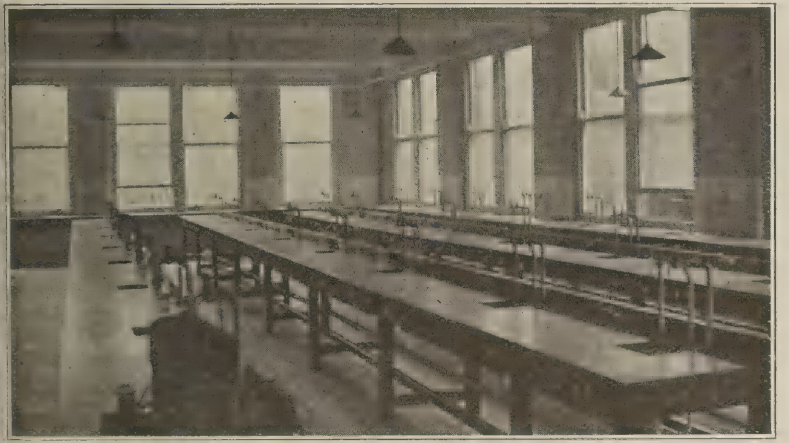
Special Articles.

GUY'S HOSPITAL MEDICAL COLLEGE.

NEW ANATOMY, BIOLOGY, AND PHYSICS DEPARTMENTS.

BEFORE a distinguished company the formal pening of the new Anatomy, Biology, and Physics Departments by the Prince of Wales, President of the ospital, took place on July 2nd. The Prince, who was received by the Treasurer of the Hospital, Lord Goschen, and Mr. H. J. Waring, Vice-Chancellor of he University of London, proceeded to a platform rected outside the Medical School, where an address was read by the Dean of the Medical School, Dr. T. B. Johnston. In the address the scheme of ebuilding the Medical School, begun in 1897 with the hysiology department and now completed by the pening of this new extension, was outlined, as well as the means by which financial difficulties were vercome, at least temporarily. The total cost of the buildings was £100,000, and part of this had to be found by borrowing; it was hoped that other benefactors would come forward to relieve the school of the ncubus of debt and so enable it to carry on the work n a manner worthy of the great traditions of Astley Cooper, Bright, Addison, Gull, and Wilks. The Prince of Wales, in opening the new extension, referred to the great value of medical research and to the national importance of the work of the great voluntary hospitals and their medical schools. Science and industry alone were not enough; the sinews of war on disease must also be forthcoming, and the door of the treasurer's department was open as continuously as that of the hospital. A vote of thanks to His Royal Highness, proposed by Dr. J. Fawcett, senior physician, and seconded by Sir Alfred Fripp, senior surgeon to the hospital, was carried with acclamation, after which the Prince inspected the new buildings. After the ceremony the guests and friends of the hospital had an opportunity of inspecting the Medical School buildings as well as the wards of the hospital. Refreshments were served in marquees in the grounds and the band of H.M. Coldstream Guards played appropriate music.

FIG. 2.

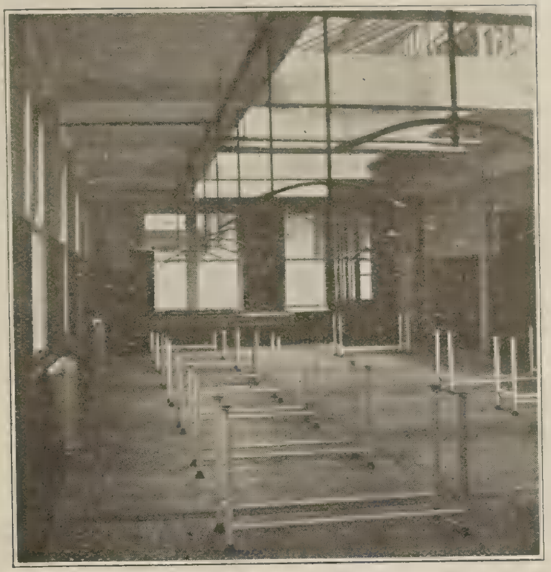


The new department of histology.

The New Buildings.

The extension provides new anatomical, biological, and physics departments, together with additional accommodation for physiology and surgery. Every possible means has been taken to render the interior of the building as light as possible, the external walls having large windows on three sides and the interior walls being of white glazed brick below and having glass partitions above as far as practicable. In the dissecting room, the operative surgery room, and the surgical research room, terrazo flooring replaces the wood blocks used in the rest of the building. The building comprises three floors and a basement; the roof has been made flat with a view to providing space for animal hutches and water tanks for breeding fresh water animals. The third floor is entirely devoted to human anatomy and contains a dissecting room, 80 feet by 24 feet, magnificently lit by large windows on three sides and by a large roof light, and having novel and elaborate arrangements for artificial lighting over each of the 16 tables (Fig. 1). A small demonstration theatre, capable of seating 50 students, leads off the dissecting room. There are also two specimen rooms and assistants' rooms. On the second floor is the histology laboratory, with well-arranged bench room for 73 students; communicating with the laboratory is a preparation room, where section cutting will be done for the anatomy, biology, and morbid histology departments, and for the Gordon Museum. Two small laboratories on this floor are intended for the private use of the lecturer on anatomy and the demonstrators, and there is also a large specimen room where reconstruction models of human and mammalian anatomy and embryology will be housed. The first floor is divided between the biology department, the physics department, and an operative surgery room, with a small surgical research room to be equipped as an operating theatre for experimental work on animals. The students' biology laboratory resembles the histology laboratory on the floor above, with slight modifications in the bench equipment and lighting. The physics department consists of a laboratory providing bench room for 50 students, an optical room, which will be shared by the physiology department, and research rooms for the lecturer and his demonstrators. The physics laboratory is equipped

FIG. 1.



The new dissecting room.

with teak-topped tables in which are covered sunken wells with a sink and water, electric and gas connexions. Power connexions are disposed where necessary. In the basement there are a number of rooms devoted to the anatomy department as well as a demonstration theatre capable of seating 70 students. There is a well-ventilated tank-room, connected with the other floors by an electric lift, a reception and preparation room, a store room, and a large workroom equipped with a machine for cutting frozen anatomical sections, as well as photomicrographic and dark rooms.

The new extension here described was designed largely with the object of providing better facilities for collaboration between the various non-clinical departments which are now, with the exception only of pathology and pharmacology, all housed under one roof. A rather striking rearrangement is the grouping of histology with human anatomy, but this is in line with the view that the study of microscopic and macroscopic anatomy should be closely associated. The provision of a room for surgical research in close association with the anatomy department was also well planned, and should be fruitful in work useful to the school and hospital. It is unfortunate, but inevitable, in such a district as the Borough that the new extension should be partly overshadowed by neighbouring buildings, so that, in spite of the very large window space, the lighting on the lower floors is not very good. This is particularly noticeable in the physics laboratory, where artificial lighting has had to be provided on a lavish scale, and applies also, though in lesser degree, to the histology laboratory. The lighting of the dissecting room, however, is magnificent, and this is perhaps the only department in which it is essential.

The buildings as a whole are admirably equipped, and students of Guy's cannot fail to react to the stimulating effect of spacious rooms so well adapted to their purpose. We congratulate them on their new college.

RESEARCH IN TROPICAL DISEASE.

III. THE LISTER INSTITUTE OF PREVENTIVE MEDICINE.

THROUGHOUT its history the Lister Institute has never ceased to take an active share in elucidating problems of vital importance in tropical disease. It has been enabled to do so, not so much by the despatch of scientific experts to tropical regions, though this form of activity has by no means been ignored when the necessary funds permitted, as by providing facilities for systematic research, both static and experimental, in those basal sciences protozoology, entomology, bacteriology, experimental pathology, and biochemistry, &c., which determine more and more, as time goes on, the lines of solid advance.

In 1906 the late Prof. Minchin was granted laboratory accommodation in the Institute for his work as university professor of protozoology. A special department of protozoology was thus formed in which systematic research on protozoa generally, as well as on those responsible for disease in man and animals, could be intensively followed. Even before the arrival of Minchin some notable studies on the experimental infection of rats with trypanosomes and the influence of chemotherapeutic agents on such infections, by the late Prof. Plimmer and various collaborators, had emanated from the Institute. From Prof. Minchin's department came many important contributions to our knowledge of trypanosomes and, more especially, of their developmental cycles in hosts like the tsetse-fly and the rat flea. Both Prof. Minchin and Miss Muriel Robertson also enjoyed a lengthy field experience in Uganda in connexion with their trypanosome studies. The Indian Plague Commission, appointed jointly by the Secretary of State for India, the Royal Society, and the Lister Institute, engaged the services of various Institute experts, all of whom contributed materially, whether at home or at Bombay, to the solution of the plague problem as one determined essentially by the bionomics of the rat flea. To other plague-stricken areas, Manchuria, Egypt, &c., the Institute has lent its experts. In 1911 a department of entomology was instituted, in charge of which was placed the late Arthur Bacot, whose unique talents, already displayed in working out the bionomics of the rat flea on behalf of the Plague Commission, were thus recognised. Bacot's achievements during the following 12 years up to his lamented death from typhus in 1922 are possibly fresh in the minds of many readers, but here may be mentioned his work with C. J. Martin on the precise mechanism by which *B. pestis* is transferred from flea to rat, his elaborate study of the bionomics of *Stegomyia fasciata* for the West African Yellow Fever Commission, and his last experimental studies on the viruses of trench fever and typhus fever carried out at home, in Poland, and in Egypt.

The departments of protozoology and entomology, now sadly deprived of their distinguished chiefs, have throughout acted as nursing grounds for research workers from many lands in search of the knowledge that would render them more efficient for prosecuting research in tropical climes. No department of the Institute, however, has failed to yield its contribution to the sum total of studies specially devoted to tropical disease problems. Subjects such as snake-venom, bacillary dysentery, cholera, leprosy of man and rat, ankylostomiasis, and leishmaniasis have at various times engaged the attention of staff or voluntary workers, British and foreign. The departments of experimental pathology and biochemistry have, as is well known, undertaken, in recent years, intensive studies on certain diseases of nutrition, beri-beri, pellagra, rickets, osteomalacia, and scurvy. The boundary line between diseases of tropical and temperate climes wears somewhat thin at times, and such studies as these cannot fail to influence profoundly standards of hygiene and well-being in the tropics as elsewhere.

TREATMENT OF EARLY MENTAL CASES IN GENERAL HOSPITALS.

INAUGURATION OF WARDS AT MIDDLESEX HOSPITAL.

THE two new wards at the Middlesex Hospital for the treatment of early mental cases "by members of the staff of St. Luke's Hospital" were formally inaugurated on June 28th, at a meeting attended by representatives of the public bodies concerned. It will be remebered that St. Luke's Hospital for Lunatics, formerly situated in Old-street, E.C., was closed in December, 1916, when it was announced that it was to be re-established as soon as circumstances would permit near Gerrards Cross, Bucks. At the present moment the hospital has central offices at 19, Nottingham-place, London, W. 1, and runs a convalescent home at Gerrards Cross, so that the establishment of beds in the Middlesex Hospital marks a considerable advance towards its actual re-establishment as a mental hospital.

Coöperation between St. Luke's and Middlesex Hospitals.

Lord Athlone, treasurer of the Middlesex Hospital, expressed his gratitude to the authorities of St. Luke's Hospital for the part they had played in bringing about the establishment of these wards. The principle of coöperation between general and special hospitals had been widely discussed and generally accepted, but he believed this to be the first example of carrying it into practice. Mr. Arthur Cross Powell, treasurer of St. Luke's Hospital, mentioned the fact that St. Luke's was founded in 1751, only six years later than the Middlesex, and had spent the greater part of its existence on a site which, although ample in size and held on a perpetual lease at an exceedingly low rental, had come to be surrounded by tram-routes, the noise of which day and by night hardly contributed to the well- ing of the patients. A few years ago the new site ad been acquired in Buckinghamshire, and it was oped to proceed with building there at an early ate. He welcomed coöperation with the Middlesex ospital in the present venture, and wished and pre- cted every success to it. Sir Coles Child described e new wards as a step beyond the out-patient epartments which have already been established at me mental hospitals for the benefit of the same type patient. The utility of these departments was riously discounted by the fact that many people ojected to going anywhere near an asylum. The resent arrangement obviated this, while providing eatment by the staff of an institution devoted to e care of the insane. He saw no reason why general ad mental hospitals should not coöperate in this ay throughout the country. Dr. C. Hubert Bond, ommissioner of the Board of Control, expressed his reat personal satisfaction, and that of the Board of ontrol, at the step which had been taken. Hitherto, e general hospital out-patient department had resented an impervious screen which no case of ental disease had been allowed to pass. He had ong hoped that the Middlesex would find the means f doing something for these patients, and had dvocated a scheme of this nature some years ago. he doors were now open, and he hoped that all eaching hospitals would follow suit.

The New Wards.

The new wards occupy the second floor of the ut-patient department, which has been recon- tructed for the purpose, and consist of a male and a emale ward, each containing three beds, and lavatories, athrooms, and nurses' room. The wards present a ost attractive and restful appearance, being well- ighted, quiet, cool, and tastefully decorated in the anner of a bedroom in a comfortable private house. hese wards are intended for the treatment of such ases of functional nervous disorder as appear likely o derive benefit by hospital in-patient treatment. hronic cases, and those which have failed to respond o treatment elsewhere, as well as patients likely to ause annoyance to others, or cases of frank insanity, vill not be admitted. Patients will be admitted from he out-patient department of the Middlesex Hospital, and during treatment they will be under the super- vision of Dr. R. W. Gilmour, who was assistant nedical officer of St. Luke's in its last years in the ity. The resources of all the special departments n the hospital will be available for such methods of nvestigation and treatment as are found desirable.

NATIONAL BABY WEEK CONFERENCE.

THE Conference opened on Monday, July 2nd, and owing to the large number of delegates was held in the Caxton Hall instead of at Carnegie House, as originally intended.

Dr. G. F. STILL took the chair at the morning session, when the presidential address was delivered by the Rt. Hon. NEVILLE CHAMBERLAIN, M.P., Minister of Health. He said that, in his opinion, the most urgent matters calling for attention in regard to maternity and child welfare were an increase in the number of infant welfare centres and of health visitors, and schemes of this kind would be regarded by him with a favourable eye. He would like to see further provision to assist in reducing maternal and early infantile mortality, in which but little progress had been made, and an improved midwifery service. A great debt was owed to volunteers who started maternity and child welfare work, and there was no sphere in which voluntary assistance could be more profitably employed.

Dr. J. S. FAIRBAIRN opened the discussion on the

Causal Factors of Infant Mortality up to One Month of Age,

dealing specially with the antenatal causes. Maternal disease and prematurity, he said, were conditions largely affecting early infantile mortality, and the diseases likely to damage the child were those in which there was some poison of the system, chemical or bacterial, or where there was formation of deleterious products in the body or accumulation owing to defective elimination. Diseases due to poisons formed within the body included the group known as toxæmias of pregnancy, of which eclampsia was the most dramatic example; those due to defective elimination covered albuminuria, kidney disease, and the like, any of which might terminate the pregnancy or cause early death of the infant. It was common knowledge among obstetricians that mothers seriously ill often had average infants; the placenta and placental cells had first claim, and the fœtus lived like a parasite on the mother. Syphilis—a common cause of stillbirth and infantile death—was a curable disease, but hard to recognise in women at an early stage. Toxæmias of pregnancy, on the other hand, were usually easy to diagnose but hard to treat.

Dr. EARDLEY HOLLAND considered that intranatal causes of death might be summed up in the one word "injuries," the majority being injuries to the head. The delicate structure of the head at birth was liable to injury from forceps or even in spontaneous birth where there was a contracted pelvis. Tearing of the dura mater and cerebral hæmorrhage were specially apt to occur in premature cases, and intracranial injuries were frequent in breech presentations, the injury being caused by too quick rather than too slow delivery of the after-coming head. Dr. Holland had, in his experience, seen one infant of seven months, who died of something else, in whom a healed tear was visible.

Prof. LOUISE MCILROY said that birth should be considered as an episode, the nine previous months being regarded as equally important with later life. She believed sepsis was usually introduced by lacerations, however small they might be. In the period of rather more than two years that her special department had been working at the Royal Free Hospital there had been no case of eclampsia. The babies were not subjected to violent artificial respiration with exposure to cold air, but were wrapped in a warm towel, their respiratory passages cleared of mucus, and left quiet. They were oiled, but not washed for three days, to prevent shock and loss of heat.

The afternoon discussion on the

Value of Maternity Homes in a Maternity and Child Welfare Scheme.

was interesting for the variety of opinions expressed. Dr. JANET CAMPBELL, as chairman, said that the Ministry of Health's policy of a large number of small maternity homes had been criticised on the scores of extravagance in expenditure and staff, the difficulty of maintaining a high standard of midwifery practice in isolated units, and the small value of such institutions as training schools, all of which criticisms she thought were justified. In 1922 there were 107 maternity homes with 1275 beds; some had not been used to their full capacity, and Dr. Campbell thought that fees had perhaps proved deterrent though they were not meant to be so. There was some discussion as to the class of patient who should be eligible for maternity homes, most speakers favouring the view that they should be for normal cases. Differing views were held as to the advisability of utilising isolation hospitals for maternity cases, Dr. W. ALLEN DALEY and Dr. S. G. MOORE both approving the idea, Miss J. C. WISHART thinking it unwise, and Dr. E. R. WOODHOUSE, of Llandudno, feeling convinced that patients would be frightened to use them. A refreshing speech was made by Councillor Mrs. LEWIS, of Barry, who said she spoke as a working woman, and knew that the women of Barry regarded the home made for them by their own man as the only proper place in which to have their babies. She would greatly like to see a rota of efficient home helps who would take complete charge of the work of the homes for at least a fortnight.

MEDICINE AND THE LAW.

HOUSE-LETTING AND INFECTION: COLLINS *v.* HOPKINS.

IN this important case the question at issue was the extent of the implied warranty by the lessor of a furnished house that it is reasonably fit for the lessee to inhabit, where there has been a case of infectious disease in the house shortly before the lessee's occupation, and with regard to the case before the court, where the disease is pulmonary tuberculosis. Mr. B. M. Collins sued Mrs. E. Hopkins, a widow, for damages for breach of an implied warranty, in letting to him a furnished house at St. Albans, that the house was reasonably fit for habitation. The plaintiff's case was that it was not so fit because the defendant's husband when suffering from pulmonary tuberculosis was living in the house until six weeks before the plaintiff was to occupy it. There was a further alleged ground of claim, that the defendant's agents had expressly warranted that Mr. Hopkins was not suffering from consumption, but Mr. Justice McCardie, in his judgment, dealt only with the first point, and the agents denied having made the statements attributed to them.

In February, 1922, Mr. Hopkins was found to be suffering from tuberculosis. He was treated in a sanatorium, but was at home in July and again at the end of August till Sept. 11th, when he went to Switzerland, where he died in December. The agreement to let was made on Oct. 14th, the tenant's occupancy to begin on Oct. 26th. The plaintiff heard of the nature of Mr. Hopkins's illness on the day after he entered the house, and at once repudiated the agreement and left it. He claimed damages, including the return of a first instalment of rent (£88).

Medical evidence for the plaintiff was given by Dr. W. J. Fenton, who said that it would not be safe to take a furnished house as described, unless there had been thorough disinfection of walls and floors and fumigation under skilled supervision by the medical officer of health. In cross-examination he admitted that he knew of no case of infection proved to have arisen from the presence of a person suffering from tuberculosis in a house six weeks before a second person inhabited it. For the defence Dr. S. Vere Pearson, who had treated Mr. Hopkins at Mundesley Sanatorium, described his case, and expressed the opinion that there was no risk in the plaintiff occupying the house on Oct. 26th. He had never heard of infection in such circumstances as those described, and said that there was no recorded instance of tuberculous infection taking place in premises which an affected person had lived in and left. Dr. E. H. Lipscomb described his treatment of Mr. Hopkins at St. Albans. He had omitted to notify the case, and had not thought it necessary that the house should be fumigated. Dr. A. L. Punch was of opinion that there would have been no danger, as in the circumstances described the life of the bacillus would not have been more than a week or two. Evidence was given by the defendant and the agent who let the house.

Mr. Justice McCardie, in a considered judgment, reviewed the law relating to the subject, and had no doubt that "an appreciable measure of actual risk justifies the tenant in throwing up his contract. A man should not be called on to expose his wife and children or himself to peril." Among the matters to be considered were the nature of the disease, the degree and persistence of its infectivity, the date when the sufferer lived in the house, and the steps taken to prevent infection. In dealing with the case before him his lordship referred to the defendant as an unsatisfactory witness, who had admitted that if she had been asked what was the matter with her husband she would have answered "slight lung trouble only," and he was of opinion that the house had been left in a very dirty state for the plaintiff to go into. He also referred to the deceased as having gone to the city and about his ordinary business when warned that he might infect others. He referred to Dr. Lipscomb's evidence as to his not having notified the disease through an oversight, and regretted that no medical man should have supervised the disinfection of a house about to be let furnished.

His lordship's final summing up of his own conclusions indicate his application of the law to the facts of the particular case: (1) "I am not satisfied that the house and its contents were free from tubercle bacilli on Oct. 26th, 1922; (2) I am satisfied that there was a substantial risk that the house and its contents were so infected with bacilli on Oct. 26th as to constitute an actual danger to the plaintiff and his household; (3) while recognising the difficulties of inference on the point I should hold, if necessary, that in fact the house and its contents were so infected with tubercle bacilli on Oct. 26th as to render it unsafe for occupation. I therefore rule that it was not reasonably fit for habitation. It follows that the plaintiff was entitled to renounce the tenancy and quit the house; also that he is entitled to damages." His lordship accordingly gave judgment for the plaintiff for £130 with costs.

NOTES FROM INDIA.

(FROM OUR OWN CORRESPONDENT.)

Education in Madras Presidency, 1917–1922.

THE report of the Director of Public Instruction for the five years ending March 31st, 1922, on the state and progress of education in Madras Presidency has recently been issued by Government. Among the items of importance to the medical profession are the following:—

(1) *Medical Inspection of School Children.*—In 1920 a system of grants-in-aid for medical inspection in aided and public schools was introduced, and over 200 schools were inspected by approved medical officers and participated in the general scheme for grants-in-aid for this work. It was originally proposed to appoint three sub-assistant surgeons to inspect Government schools and to correlate and direct the work of the other medical inspectors, but this scheme has been held in abeyance. Inspection has not yet been conducted in accordance with settled principles, universally applied; but there can be no doubt as to the urgent necessity for such inspection. Several aided secondary schools appointed medical inspectors and received grants, and some other schools, though not receiving Government grants, conducted medical inspections. So far no medical inspection has been undertaken in Government schools.

(2) *Medical College.*—The subordinate teaching staff of the Medical College has been reorganised and the system under which certain assistant surgeons were detailed for college work and given no hospital duties, while those attached to the hospitals and assisting in imparting clinical instruction to students were not given any teaching allowance, was discontinued; all assistant surgeons actually engaged in instruction, whether in the College or in the hospitals, were appointed assistants to the professors concerned and given hospital as well as teaching work and uniform rates of allowances. In February, 1920, the Government of Madras sanctioned the proposal to institute a course of training for six months in dental surgery for civil assistant surgeons and senior sub-assistant surgeons not exceeding five at a time. The first course was held in 1920 and proved a success. Post-graduate courses for civil assistant surgeons were also begun in 1920. In December, 1921, the Government of Madras directed that the students of the College should be trained in squad, company, and physical drill during their third year, and in stretcher drill and first-aid during their fourth year.

(3) *Medical Schools.*—The medical schools at Calicut, Vizagapatam, Tanjore, and Rayapuram worked throughout the period under review. In July, 1918, a new school was opened at Madura with

staff of one superintendent and four lecturers. The rength of the schools has continued to increase. uring the years 1917 to 1922 the strength of the ayapuram school increased from 310 to 569 and that the Tanjore school from 148 to 276. The total rength of schools in 1921 was 1262 as against 662 in)17. Accommodation and equipment are generally ısatisfactory: the provision of hostels has become ı urgent necessity for all the schools.

(4) *Physical Education and Hygiene.*—The last ıinquennial report stated that "the weak point ɔout physical education is that those who stand ıost in need of physical culture get least of it." his state of affairs is passing away; all inspectors eport on the advance made during the last five years. cout troops have only been really organised in [adras since 1917, but by 1920 there were 280 scout oops and packs with a total of 500 officers and over)00 scouts. In 1921 Government approved a new yllabus on hygiene for Forms I. to III.; this syllabus as translated into the principal vernaculars, and was dopted in all middle and secondary schools.

Beri-beri in Madras Presidency.

In 1918–20 Colonel R. McCarrison, I.M.S., at the ıstance of the Indian Research Fund Association, ndertook an investigation into beri-beri. As a result f his inquiries it was found that in Madras Presiency the disease is confined to a narrow tract on the ast coast comprising the districts of Ganjam, Vizaapatam, Godaveri, Kistna, Guntur, and Nellore. No ases of beri-beri have been reported from districts ying outside this strip of coast except for a few in 'ellore and in Bellary Jail. The disease attains its ıaximum degree of endemicity in the Kistna district, ying between the Kistna and Godaveri rivers, and is articularly prevalent in the neighbourhood of the eft bank of the Kistna. At the Fourth Congress of he Far Eastern Association of Tropical Medicine ıeld in 1921 it was recommended that governments oncerned should take action to discourage the case of milled rice which contains less than the standard ninimum of four-tenths of 1 per cent. of P_2O_5. The Congress also recommended the appointment of a ommission, to which each country would be asked o send a delegate, which would make recommendaions as to the best methods of bringing beri-beri ınder control. Colonel McCarrison considered that he provinces of Madras, Burma, and Bengal were ufficiently affected to require legislation; in anticipaion of such action a brief memorandum on the ubject of the causes of beri-beri has been prepared y him in consultation with the Director of Public Iealth, and this has recently been issued by the overnment of Madras for propaganda purposes, ranslations having been made into the local vernaculars of the districts affected. Legislation for milled rice nay be impracticable under present conditions, and t seems more reasonable to diffuse knowledge of the lisease and its prevention than to interfere with nill-owners and their machinery.

Chemical Examiner's Report for 1922.

Major C. Newcomb's report as usual contains a ıumber of interesting details. The total number of ases and articles examined was 3824 against 3952 n 1921. Human poisoning cases numbered 220, and stain cases 399. He says:—

> "The regularity throughout the year with which the murder cases are sent to us is striking. One would expect, I think, some seasonal variation in their numbers or some indication of the 'waves of crime' of which one reads from time to time in the newspapers. . . . So far as the statistics of this department show, there is no murder season in the Madras Presidency, and waves of crime if they exist must be very choppy ones."

Of the 220 cases of suspected human poisoning, 108 showed poison, giving a positive percentage of 49·1 as compared with 40·6 in 1921. The chemical examiner, however, regrets in this connexion that more time is not available for experimental use of new toxicological methods. Of the 108 human cases in which poison was detected, mercury was found in 32 cases, arsenic in 29, and opium in 19. Of the less common poisons two were cases of cyanide, one of iodine, one of caustic soda, one of "phenyle" and one of quinine and ergot. In four cases an unrecognisable alkaloid was extracted from the viscera. In cases of animal poisoning, arsenic was the most commonly found poison, theretin, the active principle of yellow oleander, being next common. The number of cases totalled 42. Of medico-legal cases there were 27 against 21 in the previous year. Two were concerned with the identification of supposed murdered persons from bones which had been discovered. The Chemical Examiner doubts whether, in such cases, it is possible to estimate the height of the person within three inches.

> "A case of some interest occurred in which the identity of some hairs was required. A woman was found murdered and grasped in her hand a tuft of hair which she presumably had pulled out of the murderer's head in the struggle which had taken place. A man was arrested on suspicion of having committed the murder and the tuft of hair found with the body and samples of the accused's hair were forwarded to us for an opinion as to whether they were the same. A microscopic examination of the broken ends of the hair found in the corpse's hand showed that the hair had been pulled out and not cut. Although to the naked eye one of the hairs seemed rather more curly, under the microscope, mounted in potash solution, they seemed identical, and to investigate the point further, as curliness is associated with oval cross-section, the two hairs were mounted in paraffin and cross-sections cut for me by the professor of pathology. No differences in the shape of the cross-sections could be found."

This case is still proceeding.

Madras, June 5th.

CZECHO-SLOVAKIA.

(From our own Correspondent.)

Medical Fees and Improved Cost of Living.

The Ministry of Health has issued a decree addressed to the Chambers of Physicians urging the cutting down of medical fees in accordance with the downward tendency of all prices in the Republic. The Ministry calls attention to the undeniable fall in the prices of food, raw materials, and other articles, and indicates that the medical profession should adapt its fees to this general tendency if the deflation policy of the Government is to succeed. The Chambers of Physicians are asked to take the necessary steps in coöperation with other medical organisations, and report the result to the Ministry as soon as possible. This decree will not arouse much enthusiasm amongst the medical profession; physicians argue that their fees did not keep step with prices in general when the latter were going up, and that, therefore, the present medical fees are still comparatively much below other prices. The price index of medical fees is stated to be at present only 50 per cent. of the index for the average cost of living. In spite of this fact, insurance association fees have already been cut down by 10-15 per cent., and private fees have also automatically declined under pressure of the general economic situation.

Prof. C. Chodounsky.

Prof. Charles Chodounsky recently celebrated his eightieth birthday. He is one of the oldest active physicians in the Republic, and probably the last living pupil of the famous J. E. Purkinje. Chodounsky served as Purkinje's private assistant for a year whilst studying at the University of Prague. After graduation he was forced by financial difficulties to take up private practice, although his real interest lay in research. He found means, however, of carrying on private experimental work, and was also prominent in the work of various medical organisations, being for long the moving spirit of the Scientific Association of Czech Physicians. In 1884 he became associate in balneotherapy in the medical faculty at Prague, and in 1888 he began to lecture also on pharmacology, which then became his chief object of study. In 1890 he published his "Theoretical Pharmacology," in 1896 a "Programme of Toxicology," and in 1920 a "Text-book of Pharmacology." He also published a great number of lesser studies on different problems of pharmacology, and a long series of popular articles on public health topics. He is one of the founders of Czech medical terminology. Formerly a distinguished Alpinist and sportsman, Prof. Chodounsky retains excellent health, and although he had retired from University work shortly before the war, he went to Brno (Brünn) when the new medical faculty was created there after the establishment of the Czecho-Slovak Republic, and organised the institute of pharmacology, materially assisting in the organisation of the whole faculty, and remaining at the head of the institute until he had trained his successor. He has now entered honourable retirement for the second time.

First Czecho-Slovak Tuberculosis Congress.

In May took place the first Czecho-Slovak National Congress against Tuberculosis, organised by the Society for Research in Tuberculosis, and preceded by the annual meeting of the Masaryk Antituberculosis League. There were over 350 medical men present, and 120 papers were read. The three sessions of the Congress were devoted to clinical and theoretical questions, social problems, and veterinary problems respectively. Important resolutions were adopted based largely on papers read at the Congress, and relating to the creation of special institutes for research and instruction, to the establishment in general hospitals of pavilions for advanced cases of tuberculosis in order to relieve the pressure upon sanatoriums, and to compulsory medical examination of persons who want to marry. The importance of popular public health education, especially for children, was also emphasised, and the Government was asked to study the question of the early immunisation of children. School hygiene, housing and factory inspection, and Government support of necessitous tuberculous persons were also the subjects of resolutions, together with inspection of meat and milk, and the appointment of a permanent committee for the study of tuberculosis in cattle.

Public Health Services.

REPORTS OF MEDICAL OFFICERS OF HEALTH.

THE following are the principal health statistics of a number of towns and urban districts for the year 1922:—

Name of town.	Estimated population (mid-year).	Birth-rate.	Death-rates per 1000 of population.				Death-rates per 1000 births.		
			All causes.	Tuberculosis.	Cancer.	Respiratory with influenza.	Infant mortality		Maternal mort. in childbirth.
							Legit.	Illegit.	
Coventry C. ..	129,000	18·9	10·6	1·2	1·0	2·2	70	78	2·5
Grimsby C.B. ..	83,600	24·0	13·1	1·4	1·3	2·6	91	124	3·5
Eastbourne C.B.	53,700	13·7	10·9	0·7	1·6	1·8	45	37	—
Colchester B. ..	43,740	18·0	11·9	1·1	1·4	1·2	60	79	1·3
Poole B.	43,250	20·0	14·4	1·5	1·4	2·3	77	132	4·6
Swindon B. ..	55,680	19·0	12·2	1·3	1·0	2·8	58	122	0·9
Maidstone B. ..	38,300	18·0	11·1	1·0	—	—	53	114	2·9
Hyde B.	34,100	16·5	12·7	1·1	1·3	3·0	65	33	0·0
Barry U.D. ..	39,310	23·6	11·6	1·1	0·9	2·6	84	94	3·2
Beckenham U.D.	33,160	16·0	10·7	0·8	1·5	2·6	55	50	0·0

C. = city. C.B. = county borough. B. = borough. U.D. = urban district.

Coventry.

Dr. E. H. Snell submits a table showing that the mean age at death has gradually increased from 35·1 in 1895 to 45·4 in 1922; a chart showing that since 1881 the birth-rate has come down from the neighbourhood of 35 to about 20, and the death-rate from 20 to 10; and another chart showing the drop in infantile mortality in the present century from 150 to 70. Attention is drawn to the need for covering the Spon End tank, through which passes about one-third of the city's water-supply. The housing question is still urgent. Houses closed before the war have had to be reopened and remain occupied; only gross cases of overcrowding can be dealt with, and Dr. Snell gives the details of 10 very gross cases. He also refers to the lessening frequency of rickets in the out-patient rooms of large hospitals. Of 28 notified cases of ophthalmia neonatorum, 25 made complete recoveries, 2 partial recoveries, and 1 is totally blind.

The school dentists think that the practice of charging a shilling fee for dental treatment is an obstacle. Only 1660 children out of 3338 referred for treatment actually received treatment. The total fees paid in 1922 only amounted to £68. The Corley Camp open-air school for 16 children did good service. Dr. A. H. Newton mentions the case of two of the children, who continually suffered from colds and bronchitis at home, and spent the summer at the camp, going about without shoes and stockings, without a suspicion of colds or bronchitis. The open-air class at Centaur-road school also did well. Miss E. K. Brown, the organiser of physical training, gives an interesting report of her work. She now has 52 elementary schools, one special school, and two open-air classes under her supervision. A daily physical training lesson and deep-breathing exercises in the fresh air, folk-dancing, and organised games are some of the features. Special attention is given to swimming; at the swimming gala 23 first-class certificates were awarded to girls and only 5 to boys. Miss Brown finds a great deal of mouth-breathing is simply due to long-standing neglect to use a handkerchief effectively.

Dr. Newton reports unfavourably on the way meals are supplied at the municipal restaurant. He thinks there might be more variety, more green vegetables, and more fat, but he is chiefly concerned about the service. A plateful of each course is put out on the table ready for each child coming in. The child finishes the meal in just over five minutes. One is not surprised, therefore, to hear that there have been statements from parents that the meals make the children sick. The only cutlery supplied is one spoon for both courses. Such meals can hardly be called educational in table manners.

Grimsby.

Dr. B. C. Stevens reports among the needs of Grimsby—provision for advanced consumptives (the borough already owns the site on which to build a 30-bed hospital), a maternity home, and an infants' hospital. The V.D. clinic, which has been removed from the Grimsby and District Hospital to more commodious premises in Queen-street, is proving increasingly useful. It is coöperating well with the ante-natal clinic and being used by seamen in a satisfactory manner. Dr. Stevens emphasises the need for the better protection of food from contamination, and especially advocates the wrapping of bread in waxed paper before it leaves the bakery, a method which has the additional advantage of keeping the loaf fresh. He also draws attention to the present dirty methods of handling meat, and points out that imported meat is better protected than the home product.

Eastbourne.

Dr. W. G. Willoughby points out that the most serious adverse factor in public health matters is the want of adequate housing accommodation. "Private enterprise in building, seriously injured by well-meant but pernicious legislation in 1907–10, was finished off the war. Municipal housing is a necessity because e private owner does not like families with children d does not mind if a good tenant is an old resident Eastbourne or not. In letting municipal houses eference is given to large families, and length of sidence in Eastbourne and war service are taken into nsideration. Apart from non-residents, families ithout children, and families with fair accommodan. there are about 400 families needing houses. This mber includes families in hut tenements, which ght to be abandoned as soon as possible." Of the ur genuine cases of enteric fever notified, three are id to have acquired the infection elsewhere. A fifth tified case, proved to be acute miliary tuberculosis, ve a positive Widal reaction, evidently the result of oculation during the war.

At the tuberculosis dispensary Dr. W. Muir Smith ntinues to use tuberculin in selected cases with satisctory results. The municipal midwife, who acts as a alth visitor when not engaged in obstetrical work, tended 52 confinements. The full fee, 25*s.*, for her rvices was paid in 39 cases. Eleven mothers were ovided with dentures, eight free of cost.

Colchester.

Dr. W. F. Corfield draws attention to the decline in berculosis and the increase in cancer. He again oints out the pressing need for more houses, and states at habitations are still in use that should not be lerated. There is a small revival of private building. n outbreak of diphtheria at the Essex County Hospital as promptly stamped out by "swabbing" and the olation of 12 positive contacts, over and above the 3 cases of the disease. The long-tubed bottle, after a ort return to Colchester, has again been suppressed, nd Dr. Corfield would like to see it prohibited by law.

Poole.

Dr. R. J. Maule Horne tells us there are signs that oole is coming into its own as one of the most icturesque health-resorts on the South Coast, and that r natural beauty its harbour stands comparison with ydney or Rio de Janeiro. The water is purified by hlorination and additional pumping is being installed s a safeguard against a very dry season. Cesspools re being gradually replaced by sewers ; a table shows at there were still 379 in existence last year. Dr. orne wants a modern refuse plant and condemns the ree tips as uneconomical and bad public health. Fires, fumes, flies, fungi, and four-footed fomites re the legacy." Of the 145 new houses completed uring the year, 100 are occupied by new residents, that little has been done to relieve the shortage in he congested districts. During Health Week oral psis was wisely chosen as the special theme.

Swindon.

Dr. Dunstan Brewer reports that influenza, as in ther towns, was epidemic in the beginning of the year. severe form of whooping-cough, with pneumonia as common complication, was also prevalent at the me period. The mortality, owing to overcrowding, as very high among the home-treated cases, and in ture an endeavour will be made to provide accomodation for such cases in the fever hospital. The pening of the maternity home in July and the stablishment thereat of an ante-natal clinic has upplied a long recognised need. Anxiety as to the ater-supply was relieved by the wet summer, and in he meantime progress with the new adits at Ogbourne as provided for the future.

The corporation have completed 90 new houses utside the borough and private enterprise 24 within, ut this has not relieved overcrowding, when the atural increase of the population is taken into onsideration. Nevertheless, as the report of the anitary inspector puts it, the outlook in Swindon is uch better than in some towns. Dr. Brewer coniders that the class which has suffered most is that f newly married couples in moderate circumstances. he majority of first babies are born to couples living in rooms, frequently in a single room. Families, as they increase in size, cannot move to larger houses, as formerly. Swindon's most urgent need is a hospital of about 150 beds for surgical and medical cases. The present accommodation is a private 12-bed hospital belonging to the G.W.R. Medical Fund Society, and a 32-bed cottage hospital. Swindon has grown very rapidly and used to depend upon the London hospitals.

Maidstone.

Dr. C. P. Oliver reports no extraordinary causes of sickness or invalidity during the year. Analytical reports of the water have been satisfactory. The gathering-grounds and reservoirs continue to be patrolled daily by an employee of the Water Company, and have been inspected by Dr. Oliver in company with Prof. J. Eyre, Dr. A. Greenwood (County M.O.H.), and Mr. Ware, the engineer, and invariably found to be in a satisfactory condition.

Hyde.

Dr. Nicolas Gebbie, who took over the duties of M.O.H. from Dr. J. Bennett on Feb. 6th, 1922, reports that except for an outbreak of measles in the summer the borough has been fairly free from infectious diseases. Only about 20 per cent. of the sanitary conveniences are w.c.'s with cistern flush, 65 per cent. being w.c.'s with hand or waste-water flush, and 15 per cent. pails or privy middens. The 1500 ashpits in the borough create a serious nuisance. Warnings have been issued with regard to smoke from factory chimneys, but no prosecutions were undertaken.

Overcrowding is serious, and in some parts of the borough there are three and four families living in a four-roomed cottage. Indiscriminate mixing of the sexes at all ages results. "Under these circumstances," says Dr. Gebbie, "we cannot hope for a strong race, physically, mentally, or morally." One of the pavilions at the new fever hospital forms part of the county tuberculosis scheme, and admits advanced cases of consumption. Owing to unemployment, fewer mothers have been working at the mills, and Dr. Gebbie thinks the loss to the family income was more than compensated for by the greater care taken of the children and the increased facilities for breast-feeding.

Barry Urban District and Port.

Dr. Percy W. Kent describes the small outbreak of small-pox which occurred in Barry in 1922. Two sailors, feeling ill, left their ship in London and arrived in Barry on the morning of Oct. 5th. (During the voyage there had been two seamen down with illnesses diagnosed as chicken-pox.) One of the sailors infected an unvaccinated boy, aged 4 years, who was notified as small-pox and died from a confluent attack. The notification was followed by the discovery that both sailors and the aunt of the boy were suffering from modified small-pox. All three had been vaccinated in infancy, and one of them revaccinated at 14 years of age. Prompt measures were taken as to the supervision and vaccination of contacts, and no further case occurred. Subsequently the captain of the ship was summoned by the London Port Sanitary Authority for giving incomplete information and fined £50. Another case of small-pox arrived in the port from Lisbon in July, and was removed to the small-pox hospital.

The urban district council manages an accident and surgical hospital, with a medical staff consisting of the M.O.H. as superintendent, a surgeon, three assistant surgeons, and a radiographer. Dr. G. H. Winch, the V.D. medical officer, states that the clinic, opened in October, 1921, in the same building as the maternity and child welfare and school clinics, is ideally situated, that the patients are keen and regular in their attendance, and that a large number of seamen are treated. In his opinion provision for the treatment of seamen is, as a rule, not properly organised. Dr. Kent gives evidence to show that the water-supply is not safe, and this matter is receiving the careful attention of the council.

Beckenham Urban District.

Dr. J. M. Clements reports that the urban districts of Beckenham and Penge have provided a joint maternity home, the midwives from which attend some extern cases, while an arrangement has been made with the two certified midwives practising in the district to attend other extern cases. In addition to these two midwives there are a number of unqualified persons who go out as monthly nurses under the supervision of doctors in charge of the cases. Dr. Clements is anxious for a more precise definition of the degree of supervision to be given by the doctor in charge of such cases. He also complains of the unsatisfactory arrangement by which the district council has everything to do for mothers and infants except the supervision of the midwives, which is carried out by the county council, although the work of the midwives is indissolubly bound up with the whole scheme of maternity and child welfare.

The school clinic needs extension, partly for the purpose of housing the dental clinic under the same roof. The school dentist, Mr. Robert A. Waters, shows that of 2298 children referred for treatment, 1788, or 78 per cent., were actually treated. Of the remaining 22 per cent., 18 refused treatment, two failed to keep appointments, and two said they would get private treatment, but generally failed to do so. The 18 per cent. definite refusals were sometimes due to the attitude of the parents, sometimes to the attitude of the older children, who refuse to attend even at the wish of their parents.

SCHOOL MEDICAL SERVICE.

Derbyshire.

During the year 26,744 children were medically examined, 26.389 of these coming under the routine age-groups. Of the latter 6702 were referred for treatment, and during the year 2505 children received treatment for eye trouble and 3605 for ear disease. Operations for diseased tonsils and adenoids were performed upon 1155 children; these are excluded from school for two weeks after operation. 151 cases of ringworm were treated by means of X rays; 19,936 dental extractions and 13,526 dental fillings were performed. Dr. Sidney Barwise demonstrates that the young boys and girls in Derbyshire are taller and heavier than the average of the same class in England and Wales, but in the later ages the advantage is not maintained. Examination of the secondary school children reveals the fact that postural deformities with the exception of flat-foot are much less common in boys than in girls. Of 816 boys examined, 54 had some degree of flat-foot; 2 per cent. had colour-blindness. Of 1803 girls examined in the secondary schools 270 had enlarged or septic tonsils and adenoids. Goitre was present in 194. In the more marked cases it was fairly easy to persuade the parents to have the condition treated, but in far too many of the milder cases it is still regarded as just Derbyshire neck, something that runs in the family. Tables are given showing the personal equation of the doctor in discovering and recording defects; the percentage of children referred for all conditions varying in different doctors' districts from 33·6 to 11·5 per cent. During the year 861 children were excluded from school, 105 because they were verminous, 755 for medical reasons, 287 of these being on account of tuberculosis. There were 17 permanent exclusions from school, 7 of them being on account of mental condition, 2 for epilepsy, and 2 for defective vision. Dr. Mary Gallagher gives the results of 983 cases of enlarged tonsils and adenoids upon which she operated. In one half of these cases the condition had caused secondary complications such as suppurating middle-ear disease or chronic catarrh of the middle ear with deafness, chronic inflammation and discharge from the nose. In a considerable number of cases operation had to be deferred owing to treatment for anæmia, septic teeth, &c., having to be carried out. In one case the child had to be treated for six months before she was fit for operation. Of the 983 cases operated on, 890, or 90 per cent., were discharged cured and 83 improved. In ten cases there was no improvement. In several cases operations were performed on children who had already been operated on with the guillotine—that is, a piece of the tonsil had been sliced off—and after a short time the symptoms had unfortunately recurred. Dr. Gallagher states that the cardiac condition of 30 children was such that the operation was performed without an anæsthetic. We should consider it doubtful, however, whether such a procedure would be likely to do less damage than an operation under carefully administered anæsthesia.

The school dentist submits an interesting report. He finds that 80 per cent. of the children inspected were referred for treatment, and 20 per cent. actually treated. He insists that any propaganda for the prevention of caries in children must depend on the teachers.

The Services.

ROYAL ARMY MEDICAL CORPS.

An examination for not fewer than 20 commissions in the Royal Army Medical Corps will be held in London on August 1st. Those who intend to compete should lodge their applications with the Secretary of the War Office not later than July 20th. The presence of candidates will be required in London from July 30th. A full statement of the duties and emoluments of the service will be furnished to prospective candidates on written application to the Secretary (A.M.D.1), War Office, Whitehall, S.W. 1.

Maj. A. H. Bond, from the half-pay list, is restored to the estbt.

Capt. R. Stowers retires, receiving a gratuity.

Capt. K. Masson retires on account of ill-health.

Temp. Hon. Maj. J. L. Dickie relinquishes his commn. and retains the hon. rank of Maj.

Temp. Capt. D. S. Taylor relinquishes the acting rank of Maj.

The undermentioned temp. Capts. relinquish their commissions and retain the rank of Capt.: T. A. Rothwell, S. Herbert (on account of ill-health contracted on active service), and W. J. E. Stuttaford.

TERRITORIAL ARMY.

Capt. H. J. Davidson retires, receiving a gratuity.

General List: Maj. V. H. Wardle (late R.A.M.C., T.A.) to be Capt. and relinquishes the rank of Maj.

General Hospitals: Lt.-Col. W. E. Hume and Capt. (Bt. Maj.) R. E. Kelly relinquish their commns. and are granted the rank of Col.

Sanitary Companies: Capt. R. J. S. McDowan relinquishes his commn. and retains the rank of Capt.

TERRITORIAL ARMY RESERVE.

Capt. J. Derham-Reid relinquishes his commn. and is granted the rank of Maj.

ROYAL NAVAL MEDICAL SERVICE.

Surg.-Comdrs. W. L. Martin and A. L. Hewitt to be Surg.-Capts.

ROYAL AIR FORCE.

Squadron Leader A. S. Glynn to be Wing Commander.

Flight-Lieutenants R. J. Aherne, P. H. Young, and P. T. Rutherford to be Squadron Leaders.

DEATHS IN THE SERVICES.

Surg.-General Sir Benjamin Simpson, C.B., K.C.I.E., late Surgeon-General and Sanitary Commissioner with the Government of India, died at his residence in London on June 27th. Born in 1831, he qualified with the M.R.C.S. in 1852 and graduated M.D. at Aberdeen in the following year, when he entered the Indian Medical Department. After serving as civil surgeon and on special duty in various parts of India, he was appointed guardian to the Maharajah of Kuch Behar during his visit to Europe in 1878, and in 1881 was appointed Deputy Surgeon-General with the S. Afghanistan Field Force. In 1882 he became Sanitary Commissioner to the Central Provinces, subsequently serving as Surgeon-General in the Punjab and in Bengal. He received the C.B. in 1859 and the K.C.I.E. in 1887.

IARROGATE SPA: NEW FACILITIES OF TRAVEL.

AT the invitation of the Mayor and Corporation a mber of medical men, including representatives of *British Medical Journal* and of *The Lancet*, paid week-end visit to Harrogate on June 30th and ly 1st. The occasion was the inauguration of a w Pullman Car service, arranged jointly by the ndon and North-Eastern Railway Company and Pullman Car Company, Ltd. The new service of ins is to commence on Monday, July 9th, making e journey from King's Cross to Harrogate, or vice rsa, in precisely four hours, with a non-stop run tween London and Leeds. Each train will consist two first-class and four third-class specially-built rs, comfortably furnished and tastefully decorated, th arrangements for serving meals to 180 passengers ring the journey and adequate lavatory accommodan. Judging by the trial trip, in which many portant railway officials took part, the facilities ovided leave nothing to be desired.

The medical men making up the party were as llows: Dr. John Adams, Dr. L. D. Bailey, Dr. D. M. rcroft, Dr. W. Langdon Brown, Sir Bruce Brucerter, Dr. A. G. Buchanan, Dr. H. S. Buchanan, Dr. T. Davies, Dr. Henry Dutch, Dr. H. A. Ellis, Dr. R. rtescue Fox, Dr. E. P. Furber, Dr. A. T. Bulkeley avin, Dr. Philip Hamill, Dr. W. D. Kirkwood, r. H. Moreland McCrea, Dr. B. Myers, Dr. H. H. nguinetti, Dr. W. M. Crawford Watson, Dr. Arthur esterman, Dr. E. C. Young.

On Saturday afternoon a visit was paid to the oyal Bath Hospital and Ransom Convalescent ome, which is designed for patients unable to afford ivate treatment in Harrogate, suffering from skin seases, rheumatic and kindred diseases, disorders of e liver, gout, locomotor ataxy, and lead poisoning. atients are now charged 10*s.* 6*d.* per week towards e cost of their board, unless specially exempted. dmission is on the recommendation of annual ubscribers, life governors, or contributing bodies. isitors were received by the Chairman, Mr. C. A. hodes, J.P., and shown round the hospital by one r other of the six physicians.

FIG. 1.—Harrogate in Summer: the Valley Gardens.

The visitors were entertained at the Majestic Hotel, here the Deputy Mayor presided at a public dinner n Saturday evening. "The Town of Harrogate" as proposed by Mr. R. L. Wedgwood, Chief General Ianager of the L. & N. E. Railway, who spoke of he growth of Harrogate as a health resort during wo generations without any glamour of historical ecord, and foreshadowing further improvements to ome. The Deputy Mayor, Mr. Alderman J. Sheffield, aving replied, the toast of "Our Guests" was roposed by Sir A. Ernest Bain, Chairman of the Vells and Baths and Publicity Committee. Sir Davison Dalziel responded for the Pullman Car Company, Dr. R. Fortescue Fox for the medical guests. Dr. Fox spoke of spas as a national asset, expressing his personal belief in the curative virtues of British waters and British climate, each spa having its own individual character and value. In the long run success would be achieved by each spa developing its own natural resources. Britain was happy in possessing the most tonic spas of the world, which would, if properly known, attract multitudes of foreigners. Utilisation of these natural products was, he said, a necessity for our present stage of civilisation, with its large floating population of tired people. He hoped soon to see the long delayed recognition of spa treatment by State and universities.

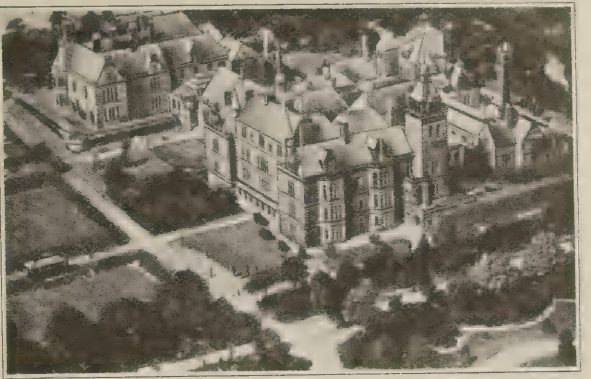


FIG. 2.—The Royal Bath Hospital, viewed from the air.

Dr. David Brown, speaking for the Harrogate Medical Society, emphasised four points in connexion with the treatment. In the first place, Harrogate made provision for persons of various means. For a hundred years the Royal Bath Hospital had provided 150 beds for the service of the poor, with an endowment of £2,200 a year and supported to the extent of six-sevenths by the visitor element. This hospital remained open all the year round, drew its patients from all parts of England, and treated 2000 patients annually. The honorary staff numbered 17 individuals and work of clinical importance and investigation was proceeding. He ventured to say that if patients of the rheumatic group reached them early enough, the bed-ridden cripple might be abolished altogether. In the second place, arrangements were in force to enable the "new poor" (with an income of under £600 a year) to obtain a combined and inclusive investigation of their case at a cost not exceeding 15 guineas. Thirdly, a school of balneology had been set up for bath attendants, who numbered in Harrogate over 200, no departmental instructor now being appointed who had not had a course of instruction lasting over two years. And lastly, much thought was being given to the scientific care of the baths and waters, an analytical chemist—a permanent servant of the Corporation—being concerned in working out the basal problems for the rationalisation of approved balneological measures.

The company attended a special concert at the Royal Hall on Saturday evening. On Sunday morning followed an inspection of the Royal Baths, closed to the public for the occasion, guests being asked to make personal use of any of the baths, of which 78 scheduled varieties are set out in the list of treatments for the current season. These are divided into three classes: (1) under the heading Balneological being included many varieties of saline-sulphur bath and douche, Nauheim, Turkish, Russian, and Berthollet baths, massage-douche on the Aix system, Vichy douche, peat baths and packs, and many others; (2) under the heading Accessory Treatments being included inhalation treatment, liver packs, paraffin wax baths, and remedial and mechanical exercises; while (3) Electrical Treatments comprise high frequency, cataphoresis, diathermy, and other currents.

Correspondence.

"Audi alteram partem."

A NEW WORD FOR "DEFATTED" VACCINES.

To the Editor of THE LANCET.

SIR,—In my paper[1] published in the last number of the *British Journal of Experimental Pathology* I gave an account of a method of preparing antigens from *B. tuberculosis* and some other Gram-positive bacteria, and I provisionally described the bacterial antigen so prepared as "defatted," a word that had been used conversationally in my laboratory. I pointed out at the same time that by the term "defatted" it was by no means intended to imply that all fatty or lipoidal substances present in the micro-organisms so treated had been removed. Only some of the lipoidal substances are taken away in this mode of preparation by washing with acetone after formalin treatment. It is plainly desirable, however, that the term "defatted" should not come into general use. It is as false, I am afraid, to the laws of language as it is to the experimental facts. I propose to introduce a new word to describe the vaccines or antigens prepared by this or similar methods of extraction. The essential factors in the process are the fixation treatment by formalin and the successful acetone extraction which the fixation permits. The bacteria so treated become, as I have described, non-acid-fast and Gram-negative, and are changed in appearance. They have been thoroughly washed out, and I propose to call them "diaplytes" from the Greek word πλυτός, washed, in its intensive form διαπλύτος, washed through and through. I propose to speak of "diaplyte vaccines" or "diaplyte antigens," and in the process of their preparation I should describe the acetone used as being the "diaplytic agent." I think there is justification for introducing a new word for the description of these vaccines, and it seems desirable to use one which has no previous connotations in pathology.

I am, Sir, yours faithfully,
GEORGES DREYER.

Department of Pathology, University of Oxford,
July 3rd, 1923.

THE DIFFERENTIAL DIAGNOSIS OF SMALL-POX AND CHICKEN-POX.

To the Editor of THE LANCET.

SIR,—The main interest of the "Mild Small-pox" discussed by Dr. J. H. Garrett in his article in THE LANCET of June 23rd is its differential diagnosis from chicken-pox; and the special relevance of that lies in the financial and communal results that flow from its correct apprehension and exposition. It comes to this. If a given case be chicken-pox it costs someone, say, one guinea. If it be small-pox, it costs someone else, say, £200. A single case, to which the writer was called, was afterwards calculated to have cost almost exactly that sum. Another single case was calculated to have cost £500. The fact is this. The freedom, which many elect to enjoy, of being able to take an attack of small-pox whenever exposed to it, is a most expensive luxury to all concerned. That is the heart of the matter.

As the present unvaccinated condition of the community throws on all of us who are qualified to practise medicine the onus, whether we like it or not, of being assistants in the matter of endeavouring to keep down this portentous communal expenditure, just so it behoves us all to be equipped with a knowledge of the fundamentals of the differential diagnosis of small-pox and chicken-pox. I have laboured in season and out of season to pass this knowledge on to my colleagues ever since the late Dr. T. F. Ricketts first impressed it on me in 1897, when he went for his summer holidays that year and left me in charge of the diagnosis of London's small-pox. The differential diagnosis, of course, in a close case, turns on the due observance of many points. But the upper extremities usually afford the strongest single item of evidence. They should be exposed to the shoulder; placed in a good light; and then *read*. Not another movement nor a word is usually necessary. The writing is usually all there, to be read by those who know the key. Centrifugal is small-pox; centripetal is chicken-pox. For those who are less expert and desire to use every possible care in arriving at a diagnosis, there may be repeated the advice given in my book "How to Diagnose Small-pox" (edition 1913, page 35).

> "Make a practice of plotting out the rash on a diagram of the figure. This most useful practice is strongly recommended. Incidentally it is evidence of care having been exercised, and is useful subsequently if a question is raised about the correctness of the diagnosis.
>
> "The act of dotting in the rash compels close observation of its distribution, and often of itself leads to a correct solution. We shall see presently that a diagnosis of small-pox can sometimes be made, after all the scabs have gone, by noting the situations of the scars or stains which have been left on the skin by the rash. Make a diagram, therefore, no matter how rough, of any case that is not perfectly straightforward. You will be surprised how much it may help you. It may by itself clear up a case that has puzzled you very much."

This advice has been followed by myself in hundreds of the cases which have been referred to me for final adjudication in London and elsewhere during the last 20 years, and its value has been attested over and over again by numerous colleagues and assistants.

I am, Sir, yours faithfully,
W. MCCONNEL WANKLYN, B.A. Camb.,
London, June 30th. M.R.C.S. Eng., D.P.H.

IS DIABETES MELLITUS A PROGRESSIVE DISEASE?

To the Editor of THE LANCET.

SIR,—A categorical answer to this question might be possible if the symptom-complex generally known by the name diabetes mellitus were a definite pathological entity, invariably arising from the same cause and always running a similar course, but this is by no means the case, and it therefore does not permit of a plain "yea" or "nay," any more than a similar question regarding a rise of temperature or the existence of painful sensations would do. Glycosuria with hyperglycæmia may arise in at least a dozen different ways, and with each the effects of treatment, and even the progress of the lesion in the untreated condition, varies so widely that it is impossible to lay down any general principle as to the progress of the resulting metabolic defects. As Dr. Langdon Brown has pointed out, all observers interested in the subject "must be familiar with cases which have become apparently stationary as a result of treatment by alimentary rest"; on the other hand, cases in which alimentary rest, however carefully carried out, has not sufficed to stay the progress of the condition must be equally familiar; and the same is true of insulin, for although a certain degree of immediate improvement can usually be obtained, permanent recovery of tolerance after a course of injections is by no means invariable. The reason undoubtedly is that we are not dealing with a pathological entity which always responds in the same way to similar treatment, but with a protean condition which no one form of treatment is able to control.

At the present time it is fashionable to assume that diabetes mellitus is invariably due to disease of the pancreas, disturbances of carbohydrate metabolism arising from other causes being referred to simply as glycosurias. In the absence of some reliable means for distinguishing pancreatic from non-pancreatic cases during life such a classification is merely juggling with words, but fortunately the means are now available, and by appropriate analyses of the blood, urine, and fæces it is possible to determine whether there is deficiency of the internal or external secretion the pancreas in any case of diabetes, and also to cognise, or exclude, most of the other causes known give rise to hyperglycæmia. Even if we limit the rm diabetes mellitus to those instances in which sease of the pancreas can be shown to exist in this ay however, we are still far from being able to swer the question in point with precision, although e are nearer doing so, for it would seem that the ogress of the disease can be stayed, and permanent provement be brought about, either by alimentary st or insulin, when the hyperglycæmia is dependent tirely, or largely, upon a functional deficiency of e internal secretion of the pancreas, also that its rogress, under suitable dietary restrictions, is slow hen the condition arises as a result of sclerosis of e gland so that the state of the patient is analogous that of a partly de-pancreatised dog, but that hen the deficiency is brought about by an attempt control, and compensate for, some other cause terfering with carbohydrate metabolism no treatent directed toward the pancreatic factor alone is more than temporary benefit.

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[1] Some New Principles in Bacterial Immunity, their Experimental Foundation, and their Application to the Treatment of Refractory Infections, Brit. J. Exper. Pathol., 1923, iv., 146.

The only answer, therefore, which can at present e given to the question under discussion in my pinion, is that, since diabetes mellitus is not a isease but a symptom-complex arising from a variety f causes, each case is more or less a law unto itself, nd whether it will progress or not depends upon the ccuracy with which it is diagnosed and how far itable methods of treatment are applied to the articular conditions discovered.

I am, Sir, yours faithfully,
P. J. CAMMIDGE.

Nottingham-place, Marylebone, W., June 26th, 1923.

THYL CHLORIDE AS AN ANÆSTHETIC FOR MINOR OPERATIONS IN CHILDREN.

To the Editor of THE LANCET.

SIR,—All anæsthetists will read with interest Ir. S. F. Rose's article on this subject in THE LANCET f June 23rd. They will doubtless agree with all e says as to the anæsthetic virtues of ethyl chloride, ut those who know how to administer it by the open method" will certainly disagree with his ictum that "breathing with admixture of air is bsolete and unsatisfactory." Indeed, to many it ill seem less enlightened to deprive a patient, articularly a child patient, of free oxygen and to nforce breathing to-and-fro into a closed bag, than to dminister an anæsthetic with a free and unlimited upply of fresh air. Surely, this method must be afer than that in which all air is excluded, and the aind of the modern hygienist must revolt at the idea f a patient inhaling "the residue left from a previous dministration." Mr. Rose acknowledges that children re not good subjects for nitrous oxide. Is not this ecause they bear deprivation of oxygen badly, and ecause, in them, this gas without oxygen quickly roduces asphyxiation? Why, then, does Mr. Rose hink that children will take ethyl chloride better vithout air than with it? Would he argue that resh air is bad for children?

Mr. Rose confesses that the closed method has one drawback"—viz., that "it may cause struggling nd holding of the breath," and he mentions the natural alarm" of the patient excited by its odour. Ie states that *both* the anæsthetist's hands are equired to hold the face-piece in position—no wonder he little patient is alarmed! Contrast this with the pen method, in which only a wire mask covered with lomette is lightly applied, with one hand, at an angle vith the bridge of the patient's nose, at first somewhat way from his mouth; and contrast the sudden presentation of the pungent vapour in a closed bag, with the gradual dropping of the ethyl chloride upon the mask, so that its vapour when inhaled is neither too pungent nor unpleasant. Mr. Rose also confesses to having experienced difficulties owing to—"holding the breath, laryngeal spasm, syncopal attacks, bstructed breathing, and vomiting." All these difficulties I submit are directly due to the closed method of administration, which enforces concentration of the vapour and causes holding of the breath and laryngeal spasm: while syncopal attacks and vomiting are in direct proportion to the duration of the rebreathing. The risks of overdose are great, and syncopal attacks and cessation of breathing are signs of overdose. Mr. Rose advocates abolition of the ocular reflexes, but in my view this is courting disaster, for when the corneal reflex is abolished the coughing reflex is also abolished: thus the sentinel of the larynx is put out of action and the risk is incurred of the patient being drowned in his own blood, or of his lungs being invaded by other foreign matter. I know some throat specialists who will not begin an operation for removal of tonsils and adenoids unless the patient's coughing reflex be brisk.

With the open method, on the other hand, I have not experienced these difficulties, except vomiting, and this rarely, in properly prepared cases, unless too deep an anæsthesia has been induced, or the induction of anæsthesia has been unduly delayed. For these reasons, some years ago, I abandoned the closed method in favour of the open method, and I teach my students at the hospital that the closed method should never be used when the open method is available, because it is more dangerous, and because it is wrong to risk unnecessarily a patient's life, for so trivial an operation as the extraction of a tooth.

I am, Sir, yours faithfully,
HARVEY HILLIARD,
Senior Anæsthetist and Lecturer on Anæsthetics
June 26th, 1923. at the Royal Dental Hospital.

FIBROMA OF THE OVARY.

To the Editor of THE LANCET.

SIR,—Dr. A. W. Owen and Dr. H. A. Lediard have discussed a type of tumour in which I still take a great deal of interest. One matter of clinical as well as pathological importance is the presence or absence of ascites as a complication. I noted, when I had the opportunity of examining a very large number of solid tumours of the ovary and uterus in the surgical wards of the Samaritan Free Hospital, that peritoneal effusion by no means necessarily means malignancy. It is seen where the tumour has a perfectly smooth surface, and may be absent where there are plenty of outgrowths or inflammatory patches. Is it not, perhaps, due to lymphatic obstruction?

I am, Sir, yours faithfully,
ALBAN DORAN,
Consulting Surgeon, Samaritan Free Hospital.
Palace Mansions, West Kensington, July 2nd, 1923.

ANCIENT SPANISH PHARMACY JARS.

To the Editor of THE LANCET.

SIR,—The very fine collection of Hispano-Moresque Pottery, made by my brother, Francis W. Mark, is to be sold at Christie's on July 10th. It contains some rare pharmacy jars of the fifteenth century. I cannot help thinking that some of them would be a very valuable addition to any of the medical museums in England, and hope some generous buyer may, perhaps, help to keep them in this country. Some of them were exhibited at a social evening at the Royal Society of Medicine this time last year, and you were good enough to note the fact in THE LANCET. An illustrated catalogue will be sent to you by Messrs. Amor who manage the sale. My brother is grieved that the collection should now be dispersed by auction, as his ambition was that it should be acquired for the nation.—I am, Sir, yours faithfully,
LEONARD MARK.

49, Oxford-terrace, Hyde Park, W., June 28th, 1923.

*** This is a remarkable collection of pharmacy jars, and we agree with Dr. Mark that it ought to be kept intact and in some suitable centre for inspection. We hope that a purchaser with the needful public spirit will present himself on July 10th.—ED. L.

THE PROPHYLACTIC TREATMENT OF PUERPERAL SEPSIS.

To the Editor of THE LANCET.

SIR,—That chloroform is the commonest cause of post-partum hæmorrhage I have long recognised, and in consequence whenever I have had to use it preliminary to using the forceps, I have prepared for such result by administering a drachm of ext. ergot liq. In my opinion the commonest cause of puerperal sepsis is gonorrhœa of a chronic variety, the secondary organisms, being the fons et origo mali, preventing the healing up of tears of vagina or perineum even when carefully sutured, even when puerperal fever be not produced, and the use of an organic preparation of silver has prevented the onset of ophthalmia neonatorum. I well remember being called to a primagravida who was suffering from false pains, and discovered chronic gonorrhœa to be present. I had ten days in which to get her disinfected, but by means of plugs saturated with acid. carbol. and glycerine 1 in 20 I achieved success, and although forceps were used and the perineum torn and sutured, her temperature never rose above 98° F., and the tear healed perfectly.—I am, Sir, yours faithfully,

Blackpool, July 1st. FR. S. PITT-TAYLOR, M.B., Ch.B.

EXPERIENCES WITH ETHANESAL.

To the Editor of THE LANCET.

SIR,—I have used ethanesal for nearly 2000 cases in eight hospitals, as well as in private practice, and I should now like to state that whatever its chemical composition, ethanesal has proved in my hands to be an anæsthetic capable of producing unconsciousness with relaxation, without pulmonary sequelæ, and in most cases with an absence of post-anæsthetic vomiting. My list includes abdominal, orthopædic, throat, cerebral and cerebellar operations, and I believe the conclusion of operators and nurses coincides with mine—namely, that ethanesal gives better results than ordinary anæsthetic ether. From my notes I find that slight sickness occurs in about 15 per cent. of the cases, severe sickness in not more than about 1 per cent. At two hospitals—the West End Hospital for Nervous Diseases and the Hospital for Epilepsy and Paralysis, Maida Vale—sickness was always absent, though many of the operations lasted two or three hours.

I am, Sir, yours faithfully,

CHARLES T. W. HIRSCH.

Hyde Park Gate, S.W., June 24th, 1923.

Obituary.

SIR JAMES REID, BT., G.C.V.O., K.C.B., M.D., C.M. ABERD., LL.D. ABERD. AND GLASG., M.D. R.U.I. (HON. CAUSÂ), F.R.C.P. LOND.,

PHYSICIAN-IN-ORDINARY TO THE LATE QUEEN VICTORIA, TO THE LATE KING EDWARD, AND TO KING GEORGE.

Sir James Reid, who died on June 28th at the age of 73, was a trusted royal physician through three generations and a distinguished member of the medical profession.

Born on Oct. 23rd, 1849, he was the eldest son of the late Dr. James Reid of Ellon, Aberdeen, and was a descendant of old Scottish stock on both his father's and mother's side. His early education was received at the Aberdeen Grammar School, where he distinguished himself by being dux and gold medallist in 1865. From here he went to the University of Aberdeen, and graduated M.A. in 1869 with honours and the gold medal, and in 1872 M.B., C.M., with highest honours, while three years later he proceeded to the M.D. degree. Shortly after graduating in medicine and surgery he came to London, where he entered on practice in Upper Westbourne-terrace for two years, and spent another two years in Vienna. Returning to this country he joined his father in practice at Ellon, where he remained till he was appointed resident medical attendant to Queen Victoria on the death of Dr. William Marshall in 1881. At Windsor Castle he acted in conjunction with Sir William Jenner, and in consequence of the failing health of that physician-in-ordinary to Her Majesty, Dr. Reid was formally appointed in 1889 to the position and received in the same year the C.B. In 1895, three years after being elected a Fellow of the Royal College of Physicians of London, he was promoted to K.C.B., and on the occasion of the Queen's Diamond Jubilee was made a baronet. On the accession of King Edward, Sir James Reid was appointed physician-in-ordinary to His Majesty and subsequently to the present sovereign. Sir James Reid's services to Queen Victoria were unremitting, paying two official visits daily wherever the court might be located, while in later years those visits were even more constant. He was a frequent visitor to foreign countries with King Edward, who as a mark of special favour granted him an honourable augmentation to his arms—namely, one of the lions of the Royal Arms of England, the Royal Stags, supporting the coat, wearing round their necks a chain carrying an escutcheon charged with the Royal Crown.

Sir James Reid, who was promoted G.C.V.O. in 1901, was an honorary LL.D. of Aberdeen and Glasgow, M.D. hon. causâ of the Royal University of Ireland, and an hon. F.R.C.P. Ireland, and his various appointments included those of consulting physician to the Convalescent Home for Officers at Osborne, to King Edward VII. Sanatorium at Midhurst, to the Prince of Wales's General Hospital at Tottenham, and to the Royal Ear Hospital. He was a retired Surgeon Lieut.-Colonel in the 2nd Battalion of the Gordon Highlanders and a justice of the peace for Aberdeenshire.

He married in 1899 the Hon. Susan Baring, daughter of Lord Revelstoke and then maid of honour to Queen Victoria, and leaves two sons and two daughters.

JOHN GIRVIN, M.R.C.S. ENG.,

COLONEL, A.M.S. (RETIRED).

LAST week there died in the person of John Girvin a loyal public servant, an educated practitioner, and an able administrator. Born in 1861 he entered St. Bartholomew's Hospital as a student in 1882, after an "apprenticeship" at Dorking—an unusual occurrence even in the "eighties," and qualified M.R.C.S., L.R.C.P. in 1886, receiving his first commission in the Army Medical Service in July of that year. From Colchester he proceeded to India, where he remained for six years, afterwards serving in Ireland, Egypt, and Cyprus. Later he was appointed to the medical charge of the Guards in Wellington Barracks, and for over two years was secretary to Sir Arthur Sloggett. He was subsequently sent to Sierra Leone and then to India a second time as senior medical officer at Hyderabad, Scinde. He returned home in 1913, and during the war helped to form a new hospital for Gallipoli, being appointed, firstly, as chief-in-charge of the advanced base hospital, and secondly, as Deputy Director of Medical Services, a position he held until the evacuation of the troops. After Gallipoli he again served in Egypt, where he was in charge of the 27th General Hospital. On returning to England after the war he fell into ill-health, caused in part by the stress of military service and in part also by the loss of his only son, and he retired with the rank of full colonel at the end of 1918. By temperament Colonel Girvin was silent and reserved, and when selected to serve in a sphere of action where ceremony and ritual are essential observances, his love of order, method, and precision caused him to respect formality and to appreciate the marks of dignity and responsibility. No one, testifies one of his colleagues, could be more faithful to his corps nor more meticulous in regard to the honour of the medical service than was John Girvin.

EDWARD LIDDON, M.D. EDIN., M.R.C.S., L.S.A.

r. Edward Liddon, who died at Taunton on e 26th at the age of 92 years, was one of the known practitioners in West Somerset during second half of the nineteenth century. The son aptain Matthew Liddon, R.N., he received his lical education at King's College, London, becoming .C.S. in 1852 and L.S.A. in the following year. ceeding to Edinburgh he graduated M.D. in 1854, ng the gold medal for his thesis. He also studied Paris and later became a Medical Associate of g's College. After holding appointments at Bath spital and at the Consumption Hospital, Brompton, oined an uncle in practice at Taunton in 1855, and ied on a large general and consulting practice until retired in 1902. At the Taunton and Somerset spital, in which he always maintained a generous rest, he held the post of hon. physician for many rs, becoming later a consulting physician and lly president. His lifelong aim was the improvement of the status and education of nurses; he was largely responsible for the foundation of the Nursing Institute attached to the Taunton Hospital, and was a pioneer in the work of providing village nurses to attend the poor. Dr. Liddon had many interests outside his profession; he was a J.P. for Somerset and a leading Churchman and educationist, being prominent in the establishment of the Huish School, now one of the most successful secondary schools in Somerset. An enthusiastic volunteer, Dr. Liddon retired with the rank of Surgeon Lieut.-Colonel of the 2nd Vol. Batt. of the Somersets. Hunting was his recreation; he was well known with the local packs of staghounds and foxhounds and was master for many years of the Taunton Vale Harriers. A man of strong personality, he held decided opinions, but was not carried away by prejudice. He was very widely respected by medical colleagues and public alike, and his benefactions among his poorer patients were many but not generally known. Dr. Liddon was twice married and leaves a widow and two sons.

Medical News.

NIVERSITY OF OXFORD.—At recent examinations following candidates were successful:—

EXAMINATION FOR DEGREE OF M.CH.

arles H. Carlton, St. John's.

FINAL EXAMINATION FOR DEGREE OF B.M.

ateria Medica and Pharmacology.—George R. P. Aldred-Brown, Keble; Eric N. Allott, Balliol; Leslie J. Barford, Queen's; Louis W. H. Bertie, St. John's; Robert B. Bourdillon, University; Vernon H. Brink, Hertford; Clarence S. Broadbent and Thomas A. J. M. Dodd, Queen's; Leslie O. F. Fysh, St. John's; Samuel Harris, Jesus; Thomas B. Hodgson, Queen's; Alfred Kendrew, Christ Church; Raymond Lewthwaite, Magdalen; Philip Morton, Keble; Eric L. Newell, Jesus; William D. B. Read, Magdalen; Thomas E. Ryves, Trinity; Bernard G. Scholefield, Christ Church; Richard W. A. Simmons, Oriel; Robert A. Walsh, Magdalen; Arthur Q. Wells, St. John's; Evelyn C. Whitehall-Cooke, Queen's; David O. Williams, Jesus; and Rosa S. Wordsworth, Lady Margaret.

thology.—Murray McCheyne Baird, New; Richard E. D. Cargill, Christ Church; Cyril W. Carter and Thomas A. J. M. Dodd, Queen's; Cyril L. Elgood, Balliol; Kenneth J. Franklin, Hertford; Douglas R. Gawler, University; Cyril A. H. Green, Trinity; Harold E. Harding, Oriel; John R. B. Hern, New; John A. Macfadyen, Brasenose; Victor P. Robinson, St. John's; James P. Shaw, Balliol; Insall M. Sidley, Christ Church; Harold N. Stokoe, Pembroke; John G. S. Thomas, Hertford; Bertram E. Tompson, Brasenose; George P. Wright, Exeter; and Mathilde E. F. Bugnion and Janet M. Vaughan, Somerville.

rensic Medicine and Public Health.—Owen D. Ballinger, University; David T. Barnes, St. John's; Edward F. Chapman, Magdalen; Alexander M. Cooke, Jesus; Richard S. Creed, Magdalen; Robert van Buren Emmons, New; John A. Macfadyen, Brasenose; George F. L. Mitcheson, Christ Church; Eric B. Strauss, New; Tom S. Townsend, Jesus; Horace F. Turney, Magdalen; and Cicely D. Williams, Somerville.

edicine, Surgery, Midwifery.—John W. Alden, non-collegiate; Philip W. Boobbyer, Keble; Thomas A. Brown, Exeter; Alexander D. Dyson, Corpus Christi; Robert van Buren Emmons, New; Reginald V. Facey, Brasenose; Humphrey C. Hill, Hertford; James P. Shaw, Balliol; Arthur L. B. Stevens, Christ Church; Eric H. Watkins, Hertford; Arthur Q. Wells, St. John's; Claude R. Young, University; William A. Young, Jesus; Sibyl R. Eastwood, Society of Oxford Home-Students; and Cicely D. Williams, Somerville.

NIVERSITY OF SHEFFIELD.—At examinations held ntly the following candidates were successful:—

M.D. EXAMINATION: Robert Platt.

FINAL M.B., CH.B. EXAMINATION.

wald H. Billington, Reginald L. Brown, Alice C. Caiger, Ida Coates, Henry Cretney, Andrew S. Drummond, Clifford S. Dunbar, Denton Guest (with 2nd class honours), William H. Harding, Mona E. Hatherley, Albert B. Nutt, Muriel R. Powell, James E. Schofield, and Annie D. Sykes.

THIRD M.B., CH.B. EXAMINATION.

illiam F. L. Castle, George S. Davidson, Edward M. Dearn, Alys M. Gregory, Sidney G. Meanley, and Oscar H. Silverman.

OCIETY OF APOTHECARIES OF LONDON.—At examins held recently the following candidates passed in the ects indicated:—

rgery.—L. P. Garrod, St. Bart.'s Hosp.; B. Hart, Sheffield; L. K. Htoe (Sect. II.), London Hosp.; and M. S. Mahmud (Sect. II.) and B. Teverson, St. Mary's Hospital.

Medicine.—L. P. Garrod, St. Bart.'s Hosp.; E. W. Hicks, St. Thomas's Hosp.; and B. Teverson, St. Mary's Hosp.

Forensic Medicine.—L. P. Garrod, St. Bart.'s Hosp.; E. W. Hicks, St. Thomas's Hosp.; J. A. H. Sykes, Edinburgh; B. Teverson, St. Mary's Hosp.; and H. Whitby, London Hosp.

Midwifery.—D. Dimitrijevitch, Oxford and St. Mary's Hosp.; L. P. Garrod, St. Bart.'s Hosp.; L. Statnigrosh, Middlesex Hosp.; and B. Teverson, St. Mary's Hosp.

The Diploma of the Society was granted to the following candidates entitling them to practise medicine, surgery, and midwifery: L. P. Garrod, B. Hart, E. W. Hicks, and B. Teverson.

ROYAL INSTITUTE OF PUBLIC HEALTH.—The Congress in 1924 will be held in Bordeaux from June 4th to 9th inclusive. The President will be Lord Burnham, and the local hon. secretaries Dr. Rene Cruchet, Professor of Medicine in the University of Bordeaux, and Mr. G. Faure, treasurer of the Chamber of Commerce, Bordeaux. The meetings will take place in the University. Special arrangements are being made for travelling and hotel accommodation.

EPSOM COLLEGE.—The seventieth annual general meeting of the Governors of Epsom College was held on June 29th at 49, Bedford-square, London, W.C., Sir Henry Morris, treasurer, presiding. The scrutineers reported that the successful candidates for pensionerships and foundation scholarships were: Ordinary Pensionership, Adelaide Lynch; Foundation Scholarships: Thomas M. Newton, Jeffrey O. Timms, James D. Johnston, Irwin J. McGhie, Denis A. Sanford, H. Vincent Adcock. In submitting the annual report of the Council Sir Henry Morris drew attention to the loss which the College had sustained by the death of Mr. Clement Locke Smiles, and by the retirement from the Council of Mr. Walter Archibald Propert, the grandson of the founder of the College, and announced that Mr. W. Douglas Crossley, who entered the College as a Master in September, 1888, and was appointed bursar in September, 1890, was about to retire, after having served the College for practically 35 years. He further reported that Mr. Bluett, one of the honorary auditors, had died since the last annual general meeting, and that the Council proposed that Colonel Norman C. King, the Registrar of the General Medical Council, should be appointed an honorary auditor in his place. Continuing, Sir Henry Morris referred to two pension funds recently instituted, and mentioned that the Council had decided to propose that, in consequence of the increased cost of living, amendments in the by-laws should be made with the view of permitting a somewhat larger income than that hitherto held by persons wishing to become candidates for various pensionerships—namely, £100 a year instead of £60. He stated that steps had been taken to begin at once the work of rebuilding the nave of the chapel in harmony with the new chancel, in spite of the fact that the funds in hand were not sufficient for the purpose, and he urged all friends of the College to do their best to secure contributions for this purpose. In thanking those persons and organisations that had assisted the Royal Medical Foundation attached to the College by obtaining donations and subscriptions during the year, he stated that it had long been customary to elect as vice-presidents those who had collected the sum of £1000, and as the Rev. Walter J. Barton, the late headmaster, had completed this sum, the Council proposed that he should be elected a vice-president of the College. At the termination of the proceedings a cordial vote of thanks to the chairman was proposed by Dr. Raymond Crawfurd, seconded by Mr. Hollis Walker, K.C., and carried with acclamation.

Society for the Study of Inebriety.—The next meeting of the society will be held in the rooms of the Medical Society of London, 11, Chandos-street, Cavendish-square, London, W., on July 10th, at 4 p.m. Prof. A. Louise McIlroy will open a discussion on the Influence of Alcohol and Alcoholism upon Antenatal and Infant Life.

Caledonian Medical Society.—The thirty-eighth annual meeting of this society was held on June 29th in the rooms of the Aberdeen Medico-Chirurgical Society. Dr. David Rorie took as the subject of his presidential address the Career of Dr. George Boswell, who was surgeon to King James VI. of Scotland. The meeting was largely attended, and at the dinner the same evening 70 members and friends were present. It was arranged to hold the next meeting of the society in Liverpool under the presidency of Dr. David Smart.

Complimentary Dinner to Dr. William Mayo.—The Surgical Section of the Royal Society of Medicine gave a complimentary dinner to Dr. William Mayo, of Rochester (Minnesota), at the Hotel Cecil on June 27th. Mr. James Berry, the President of the section, was in the chair, and there was a large attendance of Fellows and Members of the section from all parts of the United Kingdom. After the loyal toasts, the chairman proposed "Dr. William Mayo," giving a vivid account from first-hand information of the Mayo Institute at Rochester, and some pleasing glimpses into the lives of the Brothers Mayo. Dr. Mayo, in responding, spoke of the zeal for education in a State of 3 million inhabitants which had 11,000 students attending its University and 8000 more intimately connected with it. The accumulated income of the Mayo Clinic, amounting to 7 millions, not including real estate of 3½ millions, had now been handed over as permanent endowment to trustees who understood what surgical treatment meant, and he hoped that the Clinic was thus safe for a generation. Sir Berkeley Moynihan proposed "American Surgery," reciting the names and achievement of a series of American surgeons, most of whom bore Irish names, amongst them Dr. William Mayo, who, he said, was "the greatest statesman in surgery of all time." Among the characteristics of American surgery he included masterly technique, fertility in suggestion, integrity of utterance, and an unbounding hospitality to new ideas. Dr. Donald Balfour, who responded, sketched the problem of surgery in American rural practice and the possibility of raising the general standard of surgery in the U.S.A.

The Fellowship of Medicine and Post-Graduate Medical Association.—At a meeting of the General Council, held on June 26th, at 1, Wimpole-street, W., with Sir George Makins in the chair, the Council nominated the honorary officers of the Association for election at the annual meeting. The President, Sir George Makins, having intimated his desire to retire from office, it was unanimously agreed on the proposal of Mr. Carson, seconded by Dr. Myers, that Sir Arbuthnot Lane be nominated to serve in his place. It was proposed from the chair and unanimously agreed that, if willing, Sir Humphry Rolleston be nominated for re-election as chairman of the Executive Committee. On the proposal of Dr. C. B. Heald, seconded by Dr. C. O. Hawthorne, it was agreed to make no further nominations for the office of honorary treasurer, and Sir John MacAlister was unanimously nominated for re-election and also Mr. H. J. Paterson and Dr. H. MacCormac as hon. secretaries. The reports of the hon. treasurers and secretaries were received and approved for submission to the annual meeting. It was agreed that the date of the annual meeting be fixed for Friday, July 13th, at 5.30 p.m.

Medico-Psychological Association of Great Britain and Ireland.—The programme of the next quarterly meeting, to be held in London next week, is as follows: On July 10th, at 11.30 a.m., at 11, Chandos-street, a paper will be read by Dr. R. M. Stewart, entitled General Paralysis: Its Unsolved Problems. At 3 p.m., at the Royal Society of Medicine, 1, Wimpole-street, W., Lieut.-Colonel E. Goodall will give his presidential address on Considerations, Bacteriological, Toxicological and Hæmatological, and others therewith associated bearing upon the Psychoses, and at 4.30 p.m. Dr. J. G. Porter Phillips will give an address on the Early Treatment of Mental Disorder: A Critical Survey of the Out-patients' Department. On July 11th, at 10 a.m., at 11, Chandos-street, a discussion on the Relation of Chronic Sepsis to the So-called Functional Mental Disorders will be opened by Dr. Henry A. Cotton, followed by Sir W. H. Willcox, Dr. William Hunter, Dr. D. Chalmers Watson, and Dr. T. C. Graves. Dr. Clement Lovell will read a paper on the Surface Tension of the Serum in Anxiety Psychoses. In the evening the annual dinner of the Association will be held at the New Metropole Hotel, Northumberland-avenue, W.C. On July 12th, at 10 a.m., at 11, Chandos-street, a paper on the Histological Examination of 110 Cases of the Pituitary Body of Patients Dying in Asylums and Hospitals will be read by Sir Frederick Mott, F.R.S., and Dr. I. M. D. Robertson, and one on the Psychogenic Factor in the Causation of Mental Disorder by Dr. Thos. Beaton. At 3 p.m. a visit will be paid to the Maudsley Hospital, Denmark Hill, under the guidance of Dr. Edward Mapother. On July 13th, at 10 a.m., at 11, Chandos-street, the following papers will be read: Basal Metabolism in Mental Disorders, especially Dementia Præcox, and the Influence of the Diathermic Current on the Same, by Dr. James Walker; the Diagnosis of Dysenteric Infections in Mental Hospitals, by Dr. A. A. W. Petrie; and the Ranchi European Mental Hospital, India, communicated by Major Owen Berkeley-Hill.

Tuberculosis Conference at Birmingham.—The ninth annual conference of the National Association for the Prevention of Tuberculosis is to be held in the University, Edmund-street, Birmingham, from Thursday, July 12th, to Saturday, July 14th. The Lord Mayor of Birmingham will formally open the conference at 10.30 a.m. on Thursday, when a discussion will follow on the Care of Advanced Cases of Tuberculosis. The other main subjects for discussion will be the Extent and Nature of Damage Done by Tuberculosis Derived from Infected Milk; the Work of Tuberculosis Care Committees; the Relative Prevalence of Tuberculosis Among Workers in Different Trades; and the Notification of Tuberculosis with the Proposed Amendments of Procedure. The public address on Friday evening, at 7.30, will be delivered by Sir Robert Philip on the Actual Position of the Tuberculosis Problem To-Day. Saturday will be left free for tours and visits to institutions.

Parliamentary Intelligence.

HOUSE OF LORDS.

Tuesday, July 3rd.

The Value of Garden Suburbs.

The Earl of Onslow moved the second reading of the Housing, &c. (No. 2) Bill, which has passed through the House of Commons.

Lord Dawson of Penn said that for the cure of disease they were increasingly moving in the direction of open-air treatment. In the near future hospitals would be to a large extent constructed in the open with open wards. If they were going to use fresh air for the cure of disease, how much more profitable if they used it for its prevention. Any remedy, however, which was too ambitious would be crushed under its own weight, and any reform which did not carry educated opinion with it would defeat its own end. Therefore it appeared that this Bill went as far as in the present state of knowledge and public opinion it was wise to proceed. He urged the Government to give more generous consideration to that part of the Bill which was concerned with the housing of communities—to those provisions which enabled town planning and garden suburbs to be tried and expanded. Nothing could be more productive of permanent good than the extension of town planning and of garden suburbs. The Government ought to give as generous a trial as possible to the garden suburb schemes set forth in the second part of the Bill.

The Bill was read a second time.

HOUSE OF COMMONS.

Wednesday, June 27th.

Scottish Health Administration.

The House went into Committee of Supply on a Vote of £1,773,730 for the salaries and expenses of the Scottish Board of Health, Captain Fitzroy in the chair.

Captain Elliot (Parliamentary Under Secretary for Health for Scotland) said that his department had provided three main lines of statistics which it seemed to him would be of great value in estimating the effect of the recent trade depression on the health of the population. In Scotland in the years 1910–14 the average death-rate from tuberculosis was 172 per 100,000; in 1918 the rate was 118; in 1922, 119. They were therefore very considerably better than they were in the years before the war. In the years 1910–14 the five years' average for England and Wales was 140; in 1921, 113; in 1922, 112. As to phthisis, in Scotland the average death-rate for 1910–14 was 111, while in England and Wales it was 102. In 1921 the Scottish rate for phthisis was 81, while it was 88 in England and Wales. In 1922 the Scottish rate was 83, while in England and Wales it had gone up to 89. These were index figures, but they were most valuable at arriving at the true state of affairs. He would give the Committee the 1918 death-rates for some other countries. In that year the death-rate from tuberculosis (all forms) was in Scotland 160, and in England and

Wales 169. In Budapest it was 611 ; Warsaw, 591 ; Lodz, 75 ; Jugo-Slavia, 400 to 500 ; and Czecho-Slovakia, that was Prague, 386. The death-rate from influenza in all forms in our country for the three waves that swept over the country was 477 per 100,000, so that in the foreign countries he had quoted the death-rate was in relation to tuberculosis greater than the death-rate in this country from influenza.

The average infantile mortality-rate per 1000 births for 1871–80 was in Scotland 123 and in England and Wales 149. That was before the grants in regard to child welfare were made. The figures for 1911–15 were 113 in Scotland and 149 in England and Wales. In 1920–21–22 the figures for Scotland were respectively 92, 90, and 101, while for England and Wales they were 80, 83, and 77. In the first quarter of last year the rate was 141. That was when maternity and child welfare grants were given, while for the corresponding quarter of this year the figure was 98. As to insurance and sickness benefit the expenditure per week per insured person was 2*d.* in 1913 and 2¼*d.* in 1914, and the expenditure on males on sickness benefit was less than 2¼*d.* in 1920 and less than 2¾*d.* in 1921. The increase must be balanced by the fact that a big increase in the percentage of benefit had been decreed by statute. These three lines of argument went far to substantiate the contention he had advanced as to the surprising extent to which the present system was preserving the health of the people under the great industrial depression.

Referring to the tuberculosis grant, the hon. gentleman said that, roughly speaking, the Board had been able to implement their promise to pay 50 per cent. of the grant to the local authorities. A reduction was contemplated in three cases because the figure of the local authorities in those areas was a very high one, and higher than that of other local authorities who were approximately in the same position. The estimated cost of the middle ward in Glasgow was 71*s.* per week, and there was a wide discrepancy there. The figure for Glasgow for the maintenance of tuberculous patients treated in fever hospitals was 57*s.* per week, and the corresponding Mid Lanark rate was 46*s.*, as compared with the Edinburgh figure of 37*s.*, the Dundee figure of 36*s.*, and Aberdeen 38*s.* It would therefore be seen that there was, in the Board's opinion, need for further scrutiny of these figures. The reductions suggested would still enable the Glasgow authority to pay some 40*s.* per week, which was higher than Edinburgh, Dundee, or Aberdeen. Glasgow, with 29 per cent. of beds, proposed to spend 39 per cent. of the expenditure, and in the middle ward, with 10 per cent. of beds, it was proposed to spend 15 per cent. of the expenditure. The Scottish local authorities had had one or two meetings on questions of public health, and in particular there had been a very interesting conference in connexion with venereal diseases. There was a widespread feeling that further powers of compulsion should be given to these authorities by statute, particularly in relation to children. He hoped that the report of the committee appointed to inquire into the high death-rate among mothers would shortly be presented.

Mr. SULLIVAN moved to reduce the Vote by £100.

Dr. CHAPPLE said there was one very satisfactory feature of the report of the Scottish Board of Health, which was that notwithstanding the enormous unemployment and the tremendous fall in wages the death-rate was going down, the disease-rate had been going down, and mortality from tuberculosis had been going down. The unsatisfactory aspect of the report was that part in which they were told that the lack of improvement in regard to tuberculosis was largely due to the fact that they had not enough sanatoriums and not enough money. It was a tragedy that there should be people in Scotland suffering from any dire but preventable and curable disease who could not get the advantage which modern medical science and modern preventive treatment made possible for them.

In the debate which followed, Mr. MAXTON, a Glasgow Labour Member, said that at a time when an epidemic was raging in Scotland, disease was at its worst, and the death-rate at its highest, hon. gentlemen on the Ministerial side of the House, in the interest of saving money, which the right hon. Baronet the Member for the City of London approved of, issued a circular condemning children to remain in the breeding ground of infection. He called it murder, and the men who initiated the policy were murderers. They had the blood of infants on their hands.

The hon. Member was called upon to withdraw, but he refused to do so, and eventually the Speaker was called in, and Mr. Maxton was suspended from the service of the House by 258 votes to 70.

The withdrawal of the hon. Member led to further trouble on the Labour benches, and before order was finally restored three other Glasgow Labour Members, Mr. Wheatley. Mr. Stephen, and Mr. Buchanan, were also suspended.

Mr. MACPHERSON, continuing the debate, referred to the work of the Highlands and Islands Medical Service, which he said read like a romance. One fact that had always impressed itself upon him was the heroism, gallantry, the kindness and self-sacrifice of the Highland doctor. He should be glad if it was possible where the district was remote and difficult to increase what was called the mileage of these doctors. The same praise could be meted out to the nursing staff. The State should see to it that every doctor in the Highlands had a house provided out of the funds of the Board. Referring to the outbreak of botulism, which occurred in his constituency last year, Mr. Macpherson said that nothing could have exceeded the care with which the Board undertook their investigations and the promptitude with which they were on the spot.

The motion to reduce the Vote was negatived on a division by 209 votes to 118, and the vote was then agreed to.

Typhus Fever in Skye.

Mr. MAXTON asked the Under Secretary to the Scottish Board of Health what were the conditions prevailing in the Island of Raasay, Skye district, which rendered possible a recrudescence of typhus fever ; and what action had been, or was proposed to be, taken to remove the predisposing cause of a recurrence of typhus fever in the island.—Captain ELLIOT replied : While the primary cause of the outbreak of typhus fever in this locality last year is unknown, there is no reason to believe that the epidemic resulted from causes other than those social and personal conditions of life which are usually responsible for this disease. The medical officer who was sent to deal with the outbreak experienced considerable difficulty in taking measures with a view to preventing a recurrence of the disease owing to the active opposition of a proportion of the inhabitants to the treatment considered necessary by him. The matter was referred to the local authority, who did not consider it expedient in the whole circumstances to resort to compulsory measures.

Unemployment and Sickness in Salford.

Mr. TILLETT asked the Minister of Labour whether he was aware of the serious condition of the 10,000 unemployed in Salford and the ill-health arising therefrom ; and what steps he proposed to take to mitigate the evil and danger of this state of affairs, which had remained practically stationary during the past six months.—Sir M. BARLOW replied : I am aware of the regrettable extent and duration of the unemployment in Salford. Assistance has been given to various relief schemes in the locality, both through the Ministry of Transport and through the Unemployment Grants Committee, and, of course, any further schemes put forward would receive careful consideration. In addition, I understand that the Ministry of Transport are now in communication with the Lancashire County Council with a view of inaugurating in the district some substantial road works for the relief of unemployment.

Medical Research Grant.

Mr. BECKER asked the Minister of Health how the grant of £135,000 made to the Medical Research Council was disposed of ; the chief channels of its disposal ; and was £5000 the only sum which was apportioned to cancer research.—Lord E. PERCY replied : Roughly, one-third of the annual grant of £130,000 is allocated by the Medical Research Council to the payment of their research staff and the maintenance of their central laboratories at the National Institute for Medical Research. The remainder is distributed in grants in aid of research work carried out by universities, hospitals, and other centres throughout the country. In addition to the sum of £5000 expended in grants for work directly upon cancer, radium owned by the Government to the value of over £70,000 is made available by the Council for approved research into the treatment of cancer. I would, moreover, remind my hon. friend that the problems of cancer may be solved sooner, and perhaps only, through advances in fields of medical science other than the direct study of the disease itself, and that, accordingly, advances in the knowledge of cancer are effectively promoted by the grants for research in the more primary parts of the medical sciences. I may add that the allocation for cancer work varies from year to year, as the Council find useful opportunities for supplementing the work done by the Imperial Cancer Research Fund and other institutions devoted specially to this subject.

Panel Practitioners' Conditions.

Sir KINGSLEY WOOD asked the Minister of Health when the discussion between himself and representatives of the insurance practitioners and approved societies was to take place ; and whether he proposed to make a statement to the House on the conclusion of such discussion.—Lord E. PERCY replied : The Insurance Acts Committee met representatives of the Ministry yesterday to discuss recommendations of the Panel Conference in regard to the revision of the terms of service. Further discussion will be necessary on certain points with the Insurance Consultative Council. No joint conference, such as my hon. friend suggests, is contemplated at present, and it is unlikely that any definite decision as to the rate of remuneration will be reached before the autumn.

Mr. D. G. **Somerville** asked the Minister of Health the form in which the official proposals for the renewal of the panel system under the National Health Insurance Act would come before the House; and whether any such scheme would be considered in the autumn.—Lord E. **Percy** replied: Any changes in the terms of service of insurance practitioners apart from the amount of the practitioner's remuneration will involve an amendment of the regulations, and any amending regulations will be laid before Parliament in accordance with the provisions of Section 65 of the National Insurance Act, 1911. My right hon. friend is not yet in a position to say when the amending regulations will be made.

Mental Deficiency Administration.

Mr. **Frank Gray** asked the Minister of Health whether he was aware that many complaints had been made in several localities of the exercise of the wide powers conferred by the Mental Deficiency Acts, 1913 to 1919, over individuals; and whether he would cause inquiry to be made into the exercise of these powers and the foundation for the complaints made.—Lord E. **Percy** replied: As far as I am aware, the powers referred to are exercised with care and discretion. If the hon. Member has any specific cases in mind and will give me particulars I will ask the Board of Control to investigate them.

Diagnosis of Small-pox.

Mr. **Becker** asked the Minister of Health the number of cases of small-pox notified during the first three weeks of this month; had he any information to the effect that in parts of the country small-pox had been wrongly diagnosed as chicken-pox; whether the spread of small-pox was increasing or not; and whether his department attributed this to people refusing to be vaccinated.—Lord E. **Percy** replied: The figures for the week ending June 23rd are not yet available, but the number of cases of small-pox notified during the previous three weeks was 183. This figure is subject to revision in the light of information which may subsequently be received. The answer to the second part of the question is in the affirmative. As regards the third and fourth parts, my right hon. friend is advised that there has recently been an increase in the prevalence of this disease, and that the neglect of vaccination has undoubtedly contributed to its spread.

Small-pox in Gloucester.

Mr. **Lansbury** asked the Minister of Health whether, seeing that two medical men practising in Gloucester, who had had before them many more cases than any other medical men in the town, had not notified a single case of small-pox, but had certified a large number of patients as suffering from chicken-pox, and seeing that the medical officer of the town did not agree with the diagnosis and report of the Ministry of Health officials, asserting that small-pox was prevalent in the town, he would order a public inquiry into the whole facts connected with this assumed outbreak of small-pox, the inquiry to be conducted by a committee of laymen with expert advisers.—Lord E. **Percy** replied: My right hon. friend is satisfied that small-pox is prevalent in Gloucester, and sees no reason for a public inquiry into that point.

Tuberculous Treatment in Scotland.

Mr. **Wheatley** asked the Under Secretary to the Scottish Board of Health if it was the intention of the Board of Health to reduce the grant to local authorities in Scotland towards the cost of tuberculous treatment in 1923–24; and if he has received any protest from local authorities on the subject.—Captain **Elliot** replied: The Board have informed local authorities, with three exceptions, that they will pay the usual 50 per cent. grant on the actual expenditure included in their estimates for the year 1923–24, subject to audit of claims. In the case of the three authorities referred to, certain items of their estimates made provision for expenditure at rates much in excess of those for other comparable authorities, and the Board have intimated that they will pay grant only on an amount less than that provided in the local authority's estimate. As regards expenditure not included in the estimates for the year for which approval has been asked by local authorities, and to which the Board on the merits have no objection, the Board have intimated that grant can be paid only in so far as there are savings available. With regard to the last part of the question, the Board have received a copy of a resolution adopted at a conference of representatives of local authorities to the effect that the distribution of grant in aid of the treatment of tuberculosis should be made on the basis of actual approved expenditure, and not on estimated approved expenditure. The distribution of the grant for 1923–24 will, as I have explained, be substantially on the lines recommended in this resolution.

Deaths from Cancer.

Major **Molloy** asked the Minister of Health what proportion of deaths in the four decades, 1881–90, 1891–1900, 1901–10, 1911–20, and in the year 1921 from all causes other than violence or accident were due to cancer in those who lived to be 30 or upwards.—Mr. **Neville Chamberlain** replied: From 1881–1910 deaths were grouped by age in five-year periods up to 25 years, and afterwards in ten-year periods, so that it is not possible to give the required particulars for ages from 30 and upwards. The following table gives the proportion for ages from 35 and upwards for the whole of the period covered by the question, and, in addition, the proportions for 1911 to 1920 and 1921 for ages from 30 and upwards.

Percentage of Total Deaths (excluding Violence) due to Cancer.

Age 35 Years and Over.	
1881–1890	6·6
1891–1900	8·5
1901–1910	10·9
1911–1920	12·4
1921	15·3

Age 30 Years and Over.	
1911–1920.. ..	12·3
1921	14·9

Thursday, June 28th.

Ministry of Health Vote.

The House went into Committee of Supply on a Vote of £12,504,210 for the salaries and expenses of the Ministry of Health, Mr. **James Hope** in the chair.

Mr. **Neville Chamberlain** (Minister of Health) said that ever since he had taken part in public affairs, whether local or national, he had felt that improvements in the public health were of more importance to the nation than anything else. Sickness and ill-health meant that a vast army of people had to be maintained at the cost of their fellows while they were unable to work, and the withdrawal from the productive activity of the country of a large number of people who otherwise might contribute to the nation's wealth. Taking only the insured population in the year 1922, upwards of 19,500,000 weeks of work were lost from this cause alone. It was some consolation to reflect that the work that was being done by way of preventive medicine was not in vain. During the first 10 years of this century the death-rate in this country was 15·4 per 1000. In the following 10 years, including the war years, it had fallen to 14·3, not including the deaths of those who were actually killed in the war. Last year it had fallen as low as 12·8. After quoting figures to show the decrease in infantile mortality in recent years, Mr. Chamberlain said that the expectation of life among all classes of the population was steadily increasing, and a baby born to-day could reasonably expect to live 12 years longer than its grandfather. Tuberculosis and cancer were very far from being the most fatal diseases. Easily the first in fatal effects were the respiratory diseases—pneumonia, bronchitis, &c.—the high mortality from which was due to the congested conditions and polluted atmosphere of our large towns. Next to the respiratory diseases were those of the heart, and after them came the diseases of the nervous system. Cancer, which was fourth on the list, accounted for about 96 per 1000 of all deaths from all causes. He was sorry to say that this disease was increasing among our people. In 1900 cancer deaths per million of the population were 829; in 1910 they had risen to 967, and in 1921 to 1215. Two allowances must be made. The first was that methods of diagnosis were constantly improving. Then the fact that people lived longer than formerly brought a larger proportion of the population into that comparatively short span which was called the cancer age. Cancer was most prevalent between the ages of 50 and 60. He had at the Ministry of Health a Standard Medical Committee on Cancer which advised him from time to time. Researches were being undertaken by three bodies—the Cancer Research Fund, the Middlesex Hospital, and the Cancer Hospital in the Fulham-road. In addition the subject was constantly under the attention of the Medical Research Council, and in the last few weeks another body had started, the British Empire Cancer Campaign. If that new body could succeed in coöperating with the existing bodies and in forming some sort of coördinating influence between them all he would heartily welcome its existence and be glad to give it his support.

He was glad to be able to give a much more encouraging account of tuberculosis than of cancer. In 1867 the deaths from tuberculosis per million of the population were 2653; in 1887 they had fallen to 1685. In 1907 they were only 1125, and last year they were only 885 per million. Just lately two new methods of treatment had come under the notice of the Ministry of Health—the first devised by Mr. Spahlinger and the other elaborated by Prof. Dreyer of Oxford. A little while ago venereal disease was occasioning a great deal of anxiety on account of the great increase in the number of cases after the war, and arousing a great deal of controversy in the activities of two different schools of thought as to the proper method of treatment. For-ely the disease was fairly rapidly on the decline, and were going back to more normal methods and figures. might attribute a great deal of this result to the fact they had established a number of clinics throughout ountry of which there were 191 now in existence. He l that the number of clinics might be increased. The t of Lord Trevethin's Committee seemed at last to some basis upon which these two schools of thought come together and work harmoniously in the future ie common good. He hoped that it might be possible m to make some progress on the main lines suggested at committee.

all-pox, owing to the amount of vaccination that went as for some time almost extinct in this country. In there were only seven cases, but he was sorry that had been a very serious revival in the prevalence of lisease. In 1922 there were upwards of 973 cases, and ear up to June 16th there had been already 955 cases. ought it was his duty to speak plainly on this matter, ie considered that the situation was distinctly serious. ty years ago 75 per cent. of the children born were nated, and to-day only 38 per cent. were vaccinated. was a possibility of their being faced with an outbreak all-pox which would not only be dangerous to health even to life but would certainly inflict a very serious ge upon the commerce of the country. He was watch- and would continue to watch, the situation with close tion, and in the meantime he desired to emphasise ongly as he could that the one sure protection against -pox was vaccination, and that those who not only d to be vaccinated themselves but gratuitously advised s to follow their example were taking upon themselves y grave responsibility, which they might some day led to account for at the bar of public opinion. Revert- o the question of infantile mortality, the right hon. eman said that he thought it might largely be taken to e result of the infant welfare centres, of which there now 1950 in the country. They wanted more centres, pre-natal clinics, more free medical attendance, more n visitors, and improved practice in midwifery.

to the present the Voluntary Hospitals Commission pent £425,000 out of the £500,000 voted by Parliament. nately the deficits for 1921 were substantially less than been estimated, and the deficits had now practically en cleared off with the exception of a few cases in which ospitals were unable to raise the equivalent amount of y to justify a grant being made. In 1922 it was ed that the deficits would prove to have been less than anticipated. The success of what was called mass ibutions had substantially increased hospital incomes. ugh the ordinary expenditure might increase still er in the future, with the revival of trade and the tion of taxation the resources of the hospitals might pected to increase, and they need not take a gloomy spairing view of the future. More beds were required commodate patients undergoing operations or some lised treatment, and the result of the natural increase mand, coupled with the fact that there had been no se in the supply, had been that every hospital now had rible waiting list. Unless the voluntary system was to provide for the inevitable growth in the number of required and to bear the increased burden of mainten- necessitated by that, the system could not be said to anding on safe ground. While the outlook was still s, he should consider it a mistake to come to any conclusion upon it, because the voluntary system had n such remarkable vitality and persistency in extra- arily trying times. One other way in which some relief be given to the hospitals was through the Poor-law aries. In conclusion, Mr. Chamberlain pointed out the estimates of his department had been reduced in years by nearly £4,750,000. He thought that they lmost got to the end of reduction. It would really be sible to make further savings without trenching on es which in the public interests ought not to be curtailed.

KINGSLEY WOOD said some £8,250,000 per annum een paid to the 12,000 odd doctors on the panel under nsurance Acts. Since the Act had been put into force 00,000 had been paid to them. He believed, and he no doubt the Minister believed, that in very many cts the insurance medical service could be very greatly ved. One of the great defects was that only about he general practitioners of the country had undertaken e under the Act. Large numbers of doctors might big private practices, but he believed that there were a very large number who had professional objections ving under this administration, and they would never much more perfect service until they were able to t a good many more medical men and induce them to service. He made no general indictment against the ssion, but they knew that there was a great body of laints about the present service. There were far too patients on doctors' panel lists. There were some 11 per cent. of the panel practitioners who had between 2000 and 3000 patients and 3 per cent. who had over 3000 patients. That called for immediate attention and remedy. When most of these medical men had a private practice as well, how on earth they could give proper attention to either practice he could not understand. His suggestion was that insured persons should be able to change their doctor at any time after reasonable notice. He did not think that the insured patient was getting the same or as good treatment as the private patient, and yet he was certainly entitled to it. The trade union which looked after the interests of the medical men in this country had issued a document counselling the members of their Association as to what they were to do if the Minister of Health did not accede to their demands as far as remuneration was concerned. That document, as he understood it, said that in certain events unless the Minister came to terms with the medical profession they would decline to carry on and engage in the service of the Act. He hoped that his right hon. friend would take no notice of such tactics, because he believed he would have behind him the whole of the country in resisting that kind of method from a body of men from whom they expected better things.

Sir **GEORGE BERRY** emphasised the importance of milk sterilisation, which he said was compulsory in some countries. He agreed that vaccination was essential, and that it was criminal to neglect it. He would like to see the voluntary system continued. It attracted the best class of medical men. He had always been an opponent of the panel system, not so much on account of the system itself as because of the way it was worked.

Dr. **WATTS** said that in regard to the small-pox epidemic in Gloucester and certain difficulties of diagnosis he thought that was one of the strongest arguments in favour of vaccination. In his younger days no medical man would have mistaken chicken-pox for small-pox. Labour Members and others made a great point of improved sanitation in regard to the decrease in small-pox. To a certain extent and degree that was perfectly true, but it was not the whole story. Scarlet fever, measles, and small-pox had been subjected to exactly the same sanitary conditions; but whereas the first two were as prevalent to-day as they were formerly, small-pox up to the last year or two had practically died out in this country. He was not asking for fresh legislation, but merely that the law as it existed should be carried into effect. Dr. Watts referred to the danger that within a very few weeks Mr. Spahlinger's establishment and his apparatus would be sold. He wished that rather than spend hundreds of thousands a year on sanatoria the Minister of Health would devote a few thousand pounds to helping Mr. Spahlinger. As regarded the panel service, while he had been a bitter opponent of the system, and he granted that in the early days the work was bad, to-day he was of opinion that the work was cheerfully, well, and efficiently done. There might be regrettable cases here and there—there must be black sheep everywhere—but on the whole he thought the practitioners were giving good service.

Major **MALLOY** said as a doctor who had never had anything to do with national insurance, as far as his experience went, and it was a pretty large one, the work done by the panel doctors was, as a rule, extremely good, and vastly superior to anything that obtained under the old dispensation. The hon. gentleman quoted a series of statistics to show the grave rise in the number of deaths from cancer, and urged the importance of cancer research. There was a great deal of danger in relying upon the generosity of the charitable and the frightened, because that was a precarious source of income at any time. Most of the men who did the best work in the laboratories throughout the country did not get as good wages as a first-rate chauffeur. The money went in the expense of apparatus and in costly experiments which had to be continued over long periods. He thought the Ministry of Health should not only be the mainspring but the master of any efforts made in this direction.

Mr. **NEVILLE CHAMBERLAIN**, replying to the debate, said that he agreed that the panel system, whatever might have been its defects and faults, had done a very valuable service, and had done much to raise the standard of medical attendance among the poorer classes of the people. He thought it had come to stay. At the same time every effort would be made to improve the service. In view of the fact that the present arrangement for the remuneration of the doctors came to an end in December, 1924, it was necessary before settling new terms to discuss with the doctors the arrangements of the service. A certain amount of discussion had taken place already. One subject was the limitation of the panel. Another, that there should be no private fees paid for services coming within the scope of the contract. Another was greater freedom in the choice of doctors than at present, and one more, of considerable importance, was that they should be able to secure that proper records were kept of each case. It was very important that this should be done, so that there should be in existence some records of the medical history of the patient. And that also would be valuable when the patient was changing his medical practitioner. When they had some agreement on various points, then they would have to go into the question of remuneration, and he could give his hon. friends the assurance that this matter would be discussed in the House sooner or later, very probably in the course of the autumn session, because he thought it was most likely that further legislation would be necessary in order to put into operation the new arrangement to which they might come. As regarded the Spahlinger treatment, he understood that a movement was going on for the raising of a sum of money privately which, if successful—as he had some reason to hope it might be—would enable Mr. Spahlinger to produce his remedies in sufficient quantities to be available for experiment, and he would then send a supply over here, where they would be handed to the Ministry for examination. The process discovered by Dr. Dreyer, as to which they had much more complete information, was very encouraging in its results. It was the policy, however, of the Ministry to test out any remedy submitted to them which seemed at all hopeful. As to the new School of Hygiene, plans had been prepared and a site chosen near the University buildings. The school would be affiliated to the University of London, but it would be governed by a body for which a charter of incorporation was to be sought, and in the meantime the work would be carried on by a transitional executive committee with the concurrence of the Rockefeller Institute. That committee, of which he was ex-officio chairman, had to consider the possible amalgamation or coöperation with similar institutions; it would go on with the preparation of plans and probably begin the building of the institution itself. But, most important of all, it had to proceed with the appointment of a director. They hoped to be able to make an appointment before very long. With regard to the recommendations of the Cobb Committee in connexion with lunacy, there were two lines of progress which were engaging his attention. One was the prosecution of research into all forms of mental disease, which had been taken up with considerable enthusiasm by a number of local authorities; the other line was the treatment of incipient cases without certification. The Mental Treatment Bill attempted to make some progress in that direction.

The Vote was agreed to.

Pensions Disability Committee.

Mr. PIELOU asked the Minister of Pensions whether he could inform the House the composition of his Pensions Disability Committee; whether this Committee's findings had ever been published; and, if not, whether he would undertake to publish the result of the work of this Committee, especially that part that concerned the recommendations made to the doctors on the special boards in connexion with the examination of pensions for final awards.—Major TRYON replied: The Disability Committee is composed of the Presidents of the Royal Colleges of Physicians and Surgeons and of other distinguished physicians and surgeons, together with the chief medical officers of my department. The recommendations of the Committee with regard to the medical considerations which should be taken into account in determining the assessment of special classes of disability, in connexion both with conditional and final awards, are issued from time to time to all medical boards and medical officers concerned in the assessment of pensions. It would not be to the public advantage, in my opinion, to make a general publication of these recommendations of the Committee, which are of a purely technical character and deal with such questions as symptoms and diagnosis.

Changes in Pensions Headquarters in the North.

Mr. ALBERT ALEXANDER asked the Minister of Pensions whether it was proposed to amalgamate the Yorkshire regional headquarters of the Ministry with the northern regional headquarters, and to close the regional headquarters at Leeds; and, if so, what were the reasons for the proposed change. Similar questions were asked by Mr. F. JOWETT and Sir J. BUTCHER.—Major TRYON replied: The amalgamation of the northern and Yorkshire regions has been decided upon as a measure of administrative reform. I wish to emphasise the fact that the pensioners in the neighbourhood of Leeds will not be adversely affected in any way by the change, as an area office and medical boards will continue to be maintained in that city. I should not be justified in maintaining the two regions as separate units in view of the administrative economy and advantages which will result. The total staff in the Yorkshire regional headquarters, which numbers less than 300, has shown a decrease of 75 during the past six months, and will continue to decrease. It is proposed to effect the transfer gradually in the autumn, and I hope that it will be possible to house the two staffs in the existing premises at Newcastle without removing the area office. I understand that the Office of Works have other premises available for housing the income-tax office.

Nationality of Pension Doctors.

Mr. BECKER asked the Minister of Pensions if, seeing th Scotland, Wales, and Ireland insisted that doctors appoint by the Ministry were of their own nationality, he would s that, in future, the doctors appointed in England should English; and would he give preference in selecting the medical men to ex-Service doctors.—Major TRYON replied The assumption on which this question is based is n correct. In making these appointments the first consider tion is efficiency and, subject to that, it is and always h been the policy of the Ministry to give preference to tho who have served. I may add that 94 per cent. of the whol time medical officers employed by my department ha served.

Medical Examinations in Nottingham.

Mr. HAYDAY asked the Minister of Pensions where was proposed to medically examine the aged dependen of deceased Service men who were resident in Nottingha and its vicinity; and whether arrangements would be ma for them to be examined at their own homes or in proximi thereto.—Major TRYON replied: The existing arrangement which will be continued, provide for these examinations be made at area headquarters, Nottingham, or at the hom of the applicants when they are not in a condition to trav

Pitch Cancer.

Mr. DAVID WILLIAMS asked the President of the Board Trade the number of men certified as suffering from pit cancer by those engaged in the manufacture of pitch an patent fuel during the past five years; how many ha died of this disease during the same period; and how man employed in those industries had died in the same perio from other forms of cancer; and whether, in view of th growth of this disease, he would make it obligatory on th manufacturers of these commodities to use mechanica appliances in the handling of pitch wherever possible.- Mr. BRIDGEMAN (Home Secretary) replied: The numbers men reported to the Factory Department as suffering fro this disease during the five years 1918 to 1922 were follows:—In 1918, 23; in 1919, 10; in 1920, 25; in 192 18; and in 1922, 15. No fatal cases were reported in 191 to 1920; two were reported in 1921, and one in 1922. Befor 1920 the disease was not compulsorily notifiable under th Factory Act, but cases were notified under a voluntar arrangement. As the hon. Member will observe, the figure do not indicate any growth in the incidence of this diseas I regret that no information is available to show the numb of deaths in these industries during the period in questio from other forms of cancer. As regards mechanical appli ances, I understand that these are generally used whe practicable, but that they can only be used in a few opera tions. I am advised that the most effective precaution against this disease are great attention to personal cleanlines and periodic medical examination, and that facilities t enable the worker to take these precautions have bee arranged for at the instance of the Factory Department a all the works concerned.

MONDAY, JULY 2ND.

Panel Doctors' Certificates.

Mr. LOWTH asked the Minister of Health whether he ha received any communications from Poor-law guardians o other bodies or persons respecting the acceptance or otherwis of panel doctors' certificates for Poor-law relief cases; an whether he would issue such instructions to Poor-law authorities that panel doctors' certificates might be accepted —Mr. NEVILLE CHAMBERLAIN replied: The reply to th first part of the question is in the negative, and, as at present advised, I see no occasion for the revision of the existin regulations on this subject.

Cancer Mortality.

Commander OLIVER LOCKER-LAMPSON asked the Minister of Health if, having regard to the increasing prevalence of and mortality from cancer in the British Isles, he would consider the advisability of initiating in every local area under his control special machinery to investigate and, i possible, discover its cause and cure, the expenses of such machinery to be defrayed by a local rate.—Mr. NEVILLE CHAMBERLAIN replied: I am giving attention to the increasing prevalence of and mortality from cancer and the action which central or local public health authorities may be able to take in the investigation of the cause and cure of this disease. As at present advised, however, I do not consider that the establishment in every area of special machinery financed out of local rates as suggested in the question would be desirable.

Arm-to-Arm Vaccination.

Mr. RHYS DAVIES asked the Minister of Health whether he was aware that, at the present time, many medical practitioners still employed the arm-to-arm method of vaccination in private practice; and whether, in view of the serious risks attending that practice, he would consider the sirability of making representations to the medical ofession on the matter.—Mr. **Neville Chamberlain** plied : The answer to the first part of the question is in the gative. My information is that comparatively few edical practitioners now employ this method of vaccination, d I scarcely think it necessary to make representations to e medical profession on the matter.

Legacies to Hospitals.

The Finance Bill was considered on Report.

Viscount **Ednam** moved a new clause providing that gacy and succession duty should not be leviable or testientary bequests made to hospitals carried on in the public terest. He said that while the ordinary income of the spitals had increased since 1913 by 67 per cent., ordinary penditure had increased by 137 per cent. He was informed y the British Hospitals Association and the King Edward's und that the average cost to the Exchequer of the conssion would not exceed £130,000. If the voluntary system oke down the whole of this extra expense would be thrown pon the State.

Major **Cadogan** seconded. He said that so long as the luntary system was able to increase the amount of money ised on behalf of the hospitals the House ought to encourage e system, which not only saved the tax-payer something etween £3,000,000 and £4,000,000 a year, but undoubtedly nctioned far more efficiently than any State agency could ssibly do.

Sir T. **Inskip** (Solicitor-General), replying to the debate, id that at the most sanguine estimate a sum of £200,000 as involved and that was spread over 950 hospitals. It as not because the Government could not afford this sum at they were unable to grant this concession, but mainly ecause they thought it was impossible to make distinctions etween one charity and another, and that if the hospitals id work for the State, the proper course was for a grant be made from State funds.

Viscount **Ednam** said that the hospital authorities for hom he spoke did not wish to divide against the Governent, and therefore he asked leave to withdraw his new ause.

The Labour party opposed the withdrawal of the clause, hich was negatived on a division by 243 votes to 153—ajority 90.

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POSITION PAGES.—Terms on application.

A Comfort for Invalids.—The *Preston Guardian* or June 23rd contains an illustration and description of a ombination of chairs and simple accessories which should rove useful to the invalid and to the infirm. The combinaion has been devised by Sir Charles Brown, F.R.C.S., .R.C.P., who is nearing 87 years of age and has been ompelled to sleep downstairs for the past 18 months. he basis of the arrangement is an American rocking chair, hich can be fixed in either the extreme upright or horizontal osition by means of a large wedge. The companion chair, hich can be used in the day time as an ordinary chair, xtends the seat of the rocking chair, and with the aid of ushions, bed-clothes, and a hot-water bottle, a comfortable bed can be devised. An arrangement of cords allows the nvalid to arrange the hot-water bottle according to his wishes. A simple table is provided for taking meals.

Appointments.

Feldman, W. M., M.D. Lond., F.R.S. Edin., has been appointed Physician to St. Mary's Hospital for Women and Children, Plaistow.

Keith, F. L., M.D., Ch.B. Aberd., D.P.H., Medical Officer of Health for St. Pancras.

Manchester Royal Infirmary: Twining, E. W., M.R.C.S., L.R.C.P. Lond., Radiological Registrar; and Newell, R. L., M.D. Manch., F.R.C.S. Eng., Assistant Surgical Officer.

Vacancies.

For further information refer to the advertisement columns.

Barbados General Hospital.—Jun. Res. S. £250.
Barnstaple, North Devon Infirmary.—H.S. £170.
Belfast, Queen's University.—Lecturer in Pharmacology. £450.
Belgrave Hospital for Children, Clapham-road, S.W.—Hon. Radiologist. 50 guineas.
Bristol Mental Hospital.—M.O. and Pathologist. £400.
Chester, East Lancashire Tuberculosis Colony, Barrowmore Hall, Gt. Barrow, near Chester.—Med. Supt. £800.
City of London Hospital for Diseases of the Heart and Lungs, Victoria Park, E.—Physician.
Dreadnought Hospital, Greenwich, S.E.—H.P. £150.
East African Medical Service.—M.O. £600.
East London Hospital for Children and Dispensary for Women, Shadwell, E.—Part-time Pathologist. £400.
East-street Welfare Centre, Walworth, S.E.—Hon. Clin. Assts. Hon. P. for Infants.
Gloucester City.—M.O.H. £1000.
Guy's Hospital Dental School.—Senior Dental O. and Clin. Tutor. £300.
Hospital for Consumption and Diseases of the Chest, Brompton.—H.P.
Hove Hospital.—Res. M.O. £200.
King's College Hospital, Denmark Hill, S.E.—Second Asst. Radiologist. £300.
London County Mental Hospital Service.—Seventh Asst. M.O. £440.
Manchester Royal Infirmary.—Asst. Director to Clin. Lab. £350.
Miller General Hospital for South-East London, Greenwich-road, S.E.—H.P. £150.
Northampton General Hospital.—Two H.S.'s. Each £200.
Preston, Lancs, County Mental Hospital, Whittingham.—Locum Tenens M.O. £8 8s. per week.
Queen Mary's Hospital for the East End, E.—Hon. M.O. for Radio-Electro-Therapeutic Dept.
Royal Dental Hospital, London.—Hon. Asst. Dental Surg.
Royal Naval Medical Service.—Surgeon-Lieutenants.
Salford Union Infirmary, Hope, Pendleton, near Manchester.—Third and Fourth Asst. Res. M.O.'s. Each £200.
Sheffield Royal Hospital.—Cas. O. Hon. Surg. Asst. Cas. O.
Stoke-on-Trent County Borough.—Asst. M.O. £500.
West African Medical Service.—M.O. £660.
Willesden Urban District Council.—Two Asst. M O.'s. £500 and £600 respectively.
Wrexham Infirmary.—H.S. £150.

Births, Marriages, and Deaths.

BIRTHS.

Alexander.—On June 29th, at Cade House, Riverhead, Sevenoaks, the wife of J. Finlay Alexander, M.A., M.D. Camb., of a daughter.

Kerr.—On June 27th, at Baghdad, Iraq, the wife of J. Fraser Kerr, L.R.C.P. & S. Edin., Civil Surgeon, Hillah, Iraq, of a daughter. (By cable.)

Spero.—On June 26th, at Connaught-square, W., the wife of Dr. G. E. Spero, of a daughter.

MARRIAGES.

Donkin—Bates.—On June 27th, at St. James', Paddington, Sir Bryan Donkin, M.D., F.R.C.P., of London, to Marie Louise, widow of Isaac Bates, of Belfast, and daughter of the late William Preston, of Wilmington, North Carolina, U.S.A.

Hale—Coles.—On June 26th, at Watford Parish Church, John Hale, M.A., M.B. Camb., to Elsie Ledbrooke, daughter of Mr. and Mrs. Walter S. Coles, of Oxhey View, Watford, and Standean, Sussex.

DEATHS.

Liddon.—On June 26th, at Silver-street House, Taunton, Edward Liddon, M.D., aged 92.

Proudfoot.—On June 21st, at St. Clair-street, Kirkcaldy, Scotland, suddenly, Robert Butter Proudfoot, M.D., in his 65th year.

Rattray.—On July 2nd, suddenly, at Pemberton-gardens, Upper Holloway, Patrick Whyte Rattray, F.R.C.S., in his 64th year.

Whitting.—On June 25th, Charles Edward Whitting, M.A., M.B. Camb., of Buxton, aged 25 years.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Comments, and Abstracts.

TELEOLOGY AND EVOLUTION.[1]

By Sir ARTHUR KEITH, M.D. Aberd., F.R.C.S. Eng., F.R.S.,
CONSERVATOR OF THE MUSEUM AND HUNTERIAN PROFESSOR, ROYAL COLLEGE OF SURGEONS OF ENGLAND.

Teleology, a word so familiar to the generation which read the works of Archdeacon Paley, has disappeared from the vocabulary of men of science. The things for which the word stood, the numerous contrivances to be seen in the human body, still remain; indeed, as we get to know the human body better its contrivances become not less, but more wonderful. Most people believed that Darwin had explained how such contrivances had arisen, but Huxley, although convinced that Darwin's main thesis was true, held a peculiar opinion as to the exact manner in which useful contrivances or adaptations came into existence.

The Doctrine of Evolutionary Predestination.

Any opinion held by Huxley regarding the structure of man was of real value. He had been a student of human anatomy at two periods of his career—first when studying medicine at Charing Cross Hospital, from 1842 to 1846, and then later, during the crisis raised by Darwin's "Origin" in the sixties of last century, he again made the evolution and nature of man his main theme of interest. In 1876, when he was in his fifty-first year and at the zenith of his intellectual ability, he had to lecture in Glasgow, and selected the hand as the theme of his discourse—a structure which Sir Charles Bell made the subject of a Bridgewater treatise. The old teleologists regarded the contrivances of the hand as of supernatural origin. Huxley admitted the excellency of its contrivances, but held they were neither the result of supernatural interposition nor were they functionally acquired characters. He held there was no evidence to support the belief that a child's hand could be influenced in size or action by hard manual labour on the part of its parents. "To be a teleologist" he said, "and yet accept evolution, it is only necessary to suppose that the original plan was sketched out and that the purpose was foreshadowed in the molecular arrangements out of which animals have come." Here we find Huxley, the sanest and most gifted of men, preaching a doctrine of evolutionary predestination. For if we apply this abstract declaration to the hand, foot, or brain of man, it simply means that in Huxley's opinion the designs which have blossomed into existence during the evolution of our brains, feet, and hands, were already germinating in the corresponding parts of man's simian ancestor.

Strange as it may seem to laymen, this doctrine of an evolutionary predestination is held by most of the men who have traced the history of animals through long geological ages by the study of fossil remains. The evidence which accumulates relating to the origin of man's most outstanding features favours this view. Many of man's newest structural acquisitions represent phases which are transitional in the young of anthropoid apes. The hairlessness of the skin of mankind, the fairness of the complexion of Europeans, man's relatively big head poised on a small neck, a large brain, a small face and jaws, a human proportion in the segments of the limbs and in the joints of the fingers and toes are acquisitions of this kind. New human characters are foreshadowed in developmental stages passed through by apes. And that these developmental characters are new and have never been perpetuated into an adult stage until man's evolution took place, there can be no doubt. All the fossil primates of which we have any knowledge are marked, not by these fœtal characters, but by features of a reverse kind. Development is a double process—old ancestral features are recalled and new features are introduced. Business men know that capital is necessary for the development of a new and large undertaking. Nature made this discovery long ago; she places sufficient capital at the disposal of the fœtus of man and anthropoid to carry them through the nine months which are spent in the womb, and it is during this latent, preparatory period that new designs are introduced and elaborated.

If Huxley is right, then man's destinies lie hid in the potentialities of his germ-plasm. There may be some consolation in knowing that there is nothing we can say or do, eat or drink, which will alter our evolutionary destiny—except in so far as we may voluntarily select and favour certain types of man as breeders do. If we cannot compel Nature to produce the type of man we may be in search of, we can, if we are so minded, favour one of the many types which Nature tends to produce.

Human Life a Continual Experiment.

But our main consolation would lie in this: we are attempting in these passing centuries one of the great experiments of human history. Perhaps the greatest revolution which has affected human life and evolution followed the discovery of the uses of fire and its application to the preparation of human food. The human body had then its nourishment presented to it in a state which no animal body had experienced before. In these modern days the conditions of human life have been again revolutionised; we abide in cities and live in houses; we work in heated factories, we breathe air laden with fumes of diverse kinds, we eat artificially prepared and concentrated foods, many of a novel kind; we drink beverages containing alkaloids which were unknown to our ancestors. We cannot claim that our bodies are escaping certain effects produced by modern methods of life. Nature has not made our bodies fool-proof. It would be a relief to know that the source from which the new generations of mankind issue was beyond any source of permanent contamination. But is it?

Transmission of Defect.

Darwin records the case of a cow in which the eye was injured when with calf. The calf was born with the corresponding eye small and blind. An identical case has been recently recorded of a mare; one eye was injured when she was pregnant and the foal was born with the corresponding eye small and blind. These are apparently not coincidences, for certain well-known experiments, which have been carried out lately by Guyer and Smith, throw light on how such an injury is transmitted. They injected rabbits with a substance which has a selective and destructive action on the lens of the eye; many of the progeny of such rabbits had small and defective eyes. They found that the defect thus produced was hereditary; it could be handed on by the male alone. Somehow the actual germ-plasm of these rabbits had been reached, and that element which is concerned with the formation of the eye had been permanently damaged. Professor Stockard induced permanent changes in the germ-plasm of guinea-pigs by treating one generation of them to extreme and prolonged doses of alcohol. Dr. J. G. Adami has summed up the evidence on this matter in his "Medical Contributions to the Study of Evolution."

Although ordinary injuries, such as the amputation of a limb or finger, the removal of the foreskin, the rupture of the hymen, the docking of horses, dogs, or sheep, produce no apparent effect on the progeny, yet it is clear that certain substances can reach and injure the germ-plasm in such a way as to induce permanent localised defects in the progeny. It is possible that certain defects—such as contracted palate, deformed jaws, the narrowing and margination of the nasal aperture, the tendency to flat-foot, and torsion of the spine, which are so common in present-day Englishmen and were so rare in their prehistoric ancestors, are due to toxic or other substances now circulating in our bodies. Is the prevalence of shortsightedness in modern civilised populations to be ascribed to such a cause? All one can say now of these defects is that they are of recent origin, and represent features which are new to the human body. No doubt the little use made by modern people of their teeth and jaws have something to do with the appearance of these changes in their faces, but disuse alone cannot explain them.

It is one thing to produce a definite and permanent lesion of the germ-plasm; it is quite another thing to influence the germ-plasm in such a way as to make it produce a useful or contrived modification of the eye, or of the hand, or of the foot. Take the human teeth, for example. Each upper tooth fits against, or should fit against, a counterpart in the lower jaw. Yet the crowns of the teeth, the articulating or opposing dental surfaces, are perfectly formed long before they come into use. When they do come into use they become worn and deformed, yet such abrasion leads to no change in the shape of the teeth of the progeny. A study of the teeth of man and apes shows that there is a mechanism which controls the kind of pattern and relative size and shape of all the teeth. When a dentition is undergoing evolutionary strengthening, or if it is undergoing a reduction, each tooth suffers a change which affects the whole dental series in an orderly manner. The machinery which regulates the formation and evolution of teeth is one which cannot be influenced by any act or habit on the part of the parent. As Huxley declared, there is no evidence to lead us to believe that purposive modifications of structure can be produced by use. What, then, is the mechanism of their production?

Complexity of Mechanism of Growth.

Since Darwin and Huxley wrote, our conception of the machinery which controls the development of the embryo—and the machinery of development is also the machinery of evolution—has undergone a great extension. Let us take the development of that highly teleological organ—the ye—to serve as an example. A critic of Darwin said e would as soon believe that a handful of words alling at random on a table could arrange themselves in he form of a perfect poem as that the parts of the eye had een assembled by chance. In 1903 Dr. W. H. Lewis ommenced a series of experiments on developing tadpoles f a particular species, and found that when the optic cup, hich forms the retina, grows out from the brain it comes gainst the overlying ectoderm or skin of the embryo. When he optic cup makes this contact the overlying ectoderm egins to form a lens. By transplanting the optic cup, Dr. ewis found it had the power to compel the overlying ctoderm of any part to form a lens. Embryologists, by dopting the methods used by bacteriologists, have been ble to demonstrate that some tissues of the embryo exercise ontrolling influences over other tissues. The pattern in hich epithelial cells grow is altered when cells of a onnective tissue nature are added. It is clear that we are ow on the threshold of a new field of knowledge—one hich presents us with a vista of an infinite complexity of echanisms which regulate development and growth. The anner in which new and useful adaptations come into xistence, or are evolved, will become apparent as we get o know the nature of such mechanisms.

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[1] An abstract of the Huxley Memorial Lecture given at Charing Cross Hospital Medical School, June 27th, 1923. The lecture will be published in full in a future number of Nature.

We have known for many years that developing nerve ells have the power to send out processes which effect istant contacts with exceeding accuracy. But the knowledge that groups of neuroblasts have a power of migrating s new; and is, to a large extent, the result of researches arried out by Dr. Kappers of Amsterdam. These migraions affect groups of nerve cells concerned in a common unction; such a group moves towards a site which is dvantageous for the purpose it is to serve in the mechanism f the central nervous system. A change in position of this ind may be described as purposive. What influence propels r attracts these nerve groups or centres towards new sites we o not know, but the power and inclination to migrate during mbryological stages are clearly part of the machinery of the volution of the brain. The peculiar adaptational mechanisms f man's body are best studied in connexion with the evelopment of his muscles. The musculature of the face nd of expression of the higher primates represents a raduated series. The degree to which the facial muscles f man are differentiated is but the culminating phase of series of advancing stages. Differentiation of the muscles f expression keeps time with the elaboration of the brain. The ud or embryonic nucleus which gives rise to the muscles of he face is formed locally below the ear from the substance of he hyoid arch. From this sub-auricular point the embryonic nuscle cells spread outwards or migrate into all parts of the ace, head, and neck, each group reaching and arranging hemselves in their proper stations. Clearly the migratory ower of young muscle cells—whatever be the nature of the nfluence which controls them—is part of the machinery of daptation and evolution. The latissimus dorsi is another nuscle which illustrates the migratory power of embryonic nuscle cells; in this case they migrate from the neck to the oins.

The power of apparent automatic action seen in all kinds f cells in the early development of embryonic tissues is ost as fœtal stages of growth are reached. Certain wanderng cells, like leucocytes, retain this archaic property of utomatism. Bone cells, too, retain a high degree of daptability to new conditions. How they react so as to uttress a bending bone is well known. But bone cells, and lso cartilage cells, when they proceed to lay down the utlines of bones and joints, must be coördinated in their ction to an exceedingly fine degree. For when they have ompleted their work, as in the bones of the hand, a armoniously working contrivance has been produced. The roperties of embryonic bone and cartilage cells constitute art of the machinery of evolution.

It is when we seek for the evolutionary machinery which as given rise to such a delicately balanced mechanism as s seen in the human spine that we realise how complex uch a machinery must be. The bone cells which are laying lown the levers attached to each vertebra, the muscle cells rranging themselves to act on these levers, the nerve cells rouping themselves in the spinal cord, and in the brain in rder to coördinate the action of the vertebral muscle, are ll working towards a common, harmonious end—the naintenance of the human spine in the walking posture. Clearly any adaptational change must affect every one of the nillions of diverse units concerned in this functional result. That the human spine has been evolved there can be no loubt, but where is the machinery which transformed the ape's spine into that of man?

The Theory of Hormones.

I know of only one theory which assists one to explain uch evolutionary occurrences, and that is the theory of hormones as propounded by Starling in 1905. He was in no doubt as to the nature of the discovery he had made. He clearly realised that hormones formed the basis of all evolutionary progress; hormones are the means by which social life amongst the oldest and simplest of unicellular organisms is rendered possible; it is an elaboration of this system of hormonic intercommunication which makes a colony of sponge zooids possible. In the assemblage of cells which constitute the body of the human embryo we see a colony apparently governed by a system of hormones—automatic in its constitution, yet so involved and intricate that it will take centuries of research to unravel the manner of its working. The key to evolution is a knowledge of how one group of embryonic cells influences and compels another group to produce a functional result. The means used are chemical missives or hormones.

The hormone system of government—like the nervous system, which is a structural extension of the older hormone mode of government—is founded on a reflex basis. Everyone knows that, if the muscular system of a man be exercised or trained, all the other systems of his body—his bones, lungs, heart, arteries, organs of digestion also undergo a responsive growth. We cannot explain such a response unless we postulate a hormone system—one which supposes that active muscles throw out missives, and that these missives evoke a reflex growth response in structures like the bones, heart, and lungs, which are accessory in action to the muscles. Acromegaly is a morbid manifestation or disorder of the mechanism which brings about the adaptational growth-response of exercise and of training. In acromegaly we find that the pituitary gland is always involved. This gland is apparently one of the chief coördinating centres—a sort of hormone brain—of the archaic coördinating system. Missives issuing from contracting muscles evoke reflexly from the pituitary certain substances which, passing into the circulation, act on accessory structures, such as the heart, lungs, and bones.

A specimen in the Museum of Charing Cross Hospital throws a clear light on the growth-regulating machinery of the human body. It is the skull of a boy who died after an operation to arrest the growth of a tumour-like swelling on the right side of his face. As may be seen from the specimen, the over-growth is most sharply and definitely limited to one functional system of the face and head—that which is concerned in mastication. On one side the teeth, jaws, and the bony struts which support the jaws, all the parts which give support to, or are acted on, by the muscles of mastication, are markedly overgrown. The condition was congenital. We cannot explain such manifestations—for the case cited is by no means unique—unless we suppose that the growth mechanisms which regulate the assembling and deploying of cells in the embryo is constituted on a functional basis. Structures concerned in a common function are correlated by a common growth mechanism.

Automatic Properties Retained by Embryonic Cells.

John Hunter gave utterance to a great truth when he said that there remained in our vascular and bony tissues the automatic properties to be seen in the lowest forms of organised life, such as the hydra. In the formative period of the human embryo—in the phase when adaptational contrivances are being worked out in the heart, brain, bone, and muscle—the embryonic cells still retain many of the automatic properties of primitive unicellular organisms. Herbert Spencer was also right when he said that if we would understand the evolution of government and adaptation in the developing animal body, such as that of man, we would do well to study first the evolution of government in a people rising from barbarism to civilisation. In the earlier stages of the evolution of human society we see that the machinery of government is represented by the automatic working of a herd-instinct—an instinct which tends to work for the good of the community. The instinct is biased in the direction of producing functional or effective results. We have to study what in our ignorance we must call the herd-instincts of that vast community which makes up the body of a human embryo, if we would understand how the structural contrivances of the human body have been evolved. I, for one, believe with Huxley that the government which rules within the body of the embryo proceeds uninfluenced by the occurrences which affect the body of the adult. Man has come by his great gifts—his brain, his upright posture, his nimble hand—not by any effort of his own; he has fallen heir to a fortune for which neither he nor his ancestors have laboured. The human body is the vehicle of a colossal and absorbing evolutionary experiment.

HEALTH CONDITIONS IN SOMALILAND.

THE medical report for 1921 shows that during the year 4492 cases of tropical ulcers were recorded, as compared with 4654 in 1920, and cases of scurvy fell from 55 to 22. Of malaria 145 cases were reported, as against 257 in the previous year. The subtertian is the commonest type identified. A steady decline in malaria can be noted year by year. There were 113 cases of relapsing fever, compared with 64 in 1920. The distinct form of this fever noted in a previous report as confined to Burao, and apparently carried by the bed-bug, has died out. There were recorded 32 cases of small-pox (all contracted outside the Protectorate), 82 of influenza, 132 of dysentery, 719 of syphilis, and 406 of gonorrhœa. There were 186 cases of tuberculosis with 21 deaths, as against 263 cases with 24 deaths in 1920. The decrease in poverty amongst the natives due to peaceful conditions and good seasons probably accounts for the decline in this disease. The health of European officials shows a considerable improvement. Only 14 Europeans were placed on the sick list (a percentage of 1·1 to the average number resident), and these cases all occurred in Berbera. The total number of patients admitted to hospitals was 1262, as against 1998 in 1920, whilst the out-patients numbered 19,119 as compared with 17,145.

HEALTH OF GOVERNMENT OFFICIALS IN WEST AFRICA.

THE Colonial Office, in a report issued on June 14th (obtainable from the Crown Agents for the Colonies, 4, Millbank, London, S.W. 1. Price 6*d.*) draws attention to the continued improvement in the general standard of health among non-native Government officials in West Africa. So far no adverse effects appear to have resulted from the longer tours of service under the new regulations. The number invalided out of the service in 1922 was equivalent to a rate of 20·8 per 1000 as compared with 16·6 in 1921; in spite of this increase, the rate was lower than that for any year prior to 1921, with the exception of 1917, when it was 20·5. On the other hand, the death-rate last year fell to 8·0 per 1000, a decrease by one-third on the rate for 1921, and the lowest on record. The decrease was particularly marked in the Gold Coast, where the rate per 1000 was 10·5 in 1922 as compared with 20·0 in 1921, and in Nigeria, where it was 6·9 as compared with 8·4. The average number of non-native officials in service during 1922 was 3220—viz., 58 in Gambia, 206 in Sierra Leone, 946 in the Gold Coast, and 2010 in Nigeria.

The West African Medical Service forms a separate branch of the Colonial Medical Service, and details as to appointments, leave and passage, private practice, pensions and gratuities, and instruction in tropical medicine, as published periodically by the Colonial Office, appear annually in the Students' Number of THE LANCET.

CHILDREN'S COUNTRY HOLIDAYS FUND.

To the Editor of THE LANCET.

SIR,—As chairman of the London County Council, and on behalf of the children of London, I appeal for support for the Children's Country Holidays Fund. Through the medium of the fund many of our elementary school-children are enabled to benefit both physically and mentally by a fortnight's holiday in the country. It is not necessary to dwell upon the importance of the fund, but I feel that it would be a real danger if, owing to the falling off in the subscriptions, the number of children sent to the country were restricted. For the year 1923, owing to the financial position of the fund, it has been necessary to estimate for about 4000 fewer children than were sent away last year. This is the ground of my appeal, and whilst appreciating the number of calls which must be made upon the generosity of those who support the fund, I feel sure that there need be no children disappointed of their summer holiday if those to whom the objects of the fund commend themselves will assist according to their ability. Donations should be made payable to the Children's Country Holidays Fund, and should be sent to the secretary at 18, Buckingham-street, Strand, W.C. 2.

I am, Sir, yours faithfully,
HENRY C. GOOCH,
June 29th, 1923. Chairman of the London County Council.

PROFESSIONAL AND BUSINESS WOMEN'S HOSPITAL LEAGUE.

THIS friendly society, whose registered office is at 195–197, Edgware-road, London, W. 2, was founded in 1913 to make provision in severe sickness for women who earn their living by professional or business work. By means of contracts with certain hospitals arrangements are made for beds in private wards to be available for members of the League who live near London, provincial members who are unable to come to town for treatment being aided by a money grant. The annual subscription for ordinary members is 5*s.* The League is now in a flourishing condition, having more than doubled its membership during the past year.

It has been found necessary to limit the age of those joining the League as new ordinary members to 55; on the other hand, a class of student members has been constituted. A new feature of the League's activities is an arrangement whereby a firm of surgical instrument makers allows to members of the League a considerable discount off surgical appliances.

PEOPLE'S LEAGUE OF HEALTH.

AT an emergency meeting of the Medical Council of the People's League of Health, held at their headquarters, 12, Stratford-place, W. 1, it was resolved that a letter should be sent to the Council of the British Empire Cancer Campaign welcoming the establishment of that body, and suggesting a meeting of representatives of that council and members of the Medical Council of the People's League of Health, with the object of determining in what way the League could coöperate in the important work, the resolution passed by the council being: "That in view of the prevalence of cancer, the People's League of Health urges that a cancer survey of Great Britain would be advisable." In July, 1920, the subject of an international cancer survey was discussed by the Medical Council of the League. In view of the great financial stringency prevailing at that time consequent upon the war it was then decided that further action should be postponed. It is on an international basis, through the organisations and institutions with which the League is in touch in India, China, Japan, Australia, Italy, France, Belgium, Czecho-Slovakia, and the United States of America, that the People's League of Health is hoping to be of use to the Council of the British Empire Cancer Campaign.

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

MEETINGS OF SECTIONS.

Thursday, July 12th.

DERMATOLOGY: at 5 P.M. (Cases at 4.30 P.M.) Cases will be shown.

Tuesday, July 17th.

GENERAL MEETING OF FELLOWS: at 5 P.M. Ballot for election to the Fellowship.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE POST-GRADUATE LECTURES, 1, Wimpole-street, W.
WEDNESDAY, July 11th.—5.30 P.M., Mr. H. S. Souttar: The Surgery of Intracranial Tumours.

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith-road, W.
MONDAY, July 9th.—10 A.M., Mr. Maingot: Surgical Pathology. 2.30 P.M., Dr. Saunders: Medical Wards. 3 P.M., Mr. Simson: Diseases of Women.
TUESDAY.—10 A.M., Mr. Steadman: Dental Dept. 2 P.M., Mr. Sinclair: Surgical Out-patients. 2.30 P.M., Mr. Tyrrell Gray: Surgical Wards.
WEDNESDAY.—10 A.M., Dr. Saunders: Medical Diseases of Children. 12.15 P.M., Dr. Burnford: Medical Pathology. 3 P.M., Dr. Pernet: Skin Dept.
THURSDAY.—10 A.M., Dr. Grainger Stewart: Neurological Dept. 2 P.M., Mr. Bishop Harman: Eye Dept. 2 P.M., Mr. MacDonald: Genito-Urinary Dept.
FRIDAY.—10 A.M., Dr. Drummond Robinson: Gynæcological Operations. 11 A.M., Dr. McDougal: Electrical Dept. 2 P.M., Mr. Banks-Davis: Throat, Nose, and Ear Dept.
SATURDAY.—9.30 A.M., Dr. Burnford: Bacterial Therapy. 10 A.M., Dr. Saunders: Medical Diseases of Children. 10 A.M., Mr. Banks-Davis: Operations on Throat, Nose, and Ear.
Daily, 10 A.M. to 6 P.M., Saturdays, 10 A.M. to 1 P.M., In-patients, Out-patients, Operations, Special Departments.

SOUTH-WEST LONDON POST-GRADUATE ASSOCIATION, St. James' Hospital, Ouseley-road, Balham, S.W.
THURSDAY, July 12th.—4.30 P.M.: Dr. R. Worth: Demonstration of Mental Cases at the Springfield Mental Hospital.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.
Demonstration of Clinical Cases at 3.30 P.M.
MONDAY, July 9th.—Medical: Dr. J. Browning Alexander.
TUESDAY.—(3 P.M.) Surgical: Mr. Howell Evans.
WEDNESDAY.—Eye Cases: Mr. Norman B. B. Fleming.
THURSDAY.—Surgical: Mr. H. W. Carson.
FRIDAY.—Diseases of Children: Dr. C. E. Sundell.

LONDON HOSPITAL MEDICAL COLLEGE, Mile End, E.
WEDNESDAY, July 11th.—4.15 P.M., Dr. W. M. Feldman: The Physiology of the Infant.
FRIDAY.—4.15 P.M., Mr. H. S. Souttar: Intracranial Tumours.

HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.
THURSDAY, July 12th.—4 P.M., Dr. Pearson: Indigestion after Infancy.

QUEEN CHARLOTTE'S LYING-IN HOSPITAL, Marylebone-road, N.W.
THURSDAY, July 12th.—5 P.M., Mr. L. C. Rivett: Stillbirth.

THE LANCET

No. 5211. LONDON, SATURDAY, JULY 14, 1923. Vol. CCV.

CONTENTS

THE WHOLE OF THE LITERARY MATTER IN THE LANCET IS COPYRIGHT.

OST-GRADUATE LECTURES on the Surgery of the Thyroid Gland. By A. J. WALTON, M.S., F.R.C.S. Lecture I.: Adenomata. — Colloid Goitre 53
LECTURE on Problems of Acclimatisation. By ANDREW BALFOUR, C.B., C.M.G., M.D., F.R.C.P. . 84

ORIGINAL ARTICLES.

isurance Practice: A Review with Certain Criticisms and Constructive Proposals. By A. GARVIE, M.D. 60
he Cause of Death in Intestinal Obstruction. By SETON PRINGLE, F.R.C.S. 62
Case of Inspiratory Apnœa in a New-Born Infant. By W. DOUGLAS KIRKWOOD, M.D., and BERNARD MYERS, C.M.G., M.D., M.R.C.P. With Pathological Report by THOMAS W. LUMSDEN, M.D.—(*Illustrated*) 65
he Mode of Transmission of Malaria: A Hypothesis Advanced by Richard Pfeiffer in 1892. By C. M. WENYON, C.M.G., C.B.E., M.B., B.S., B.Sc. 68
urther Notes on Small-pox Diagnosis. By W. McCONNEL WANKLYN, B.A., M.R.C.S., D.P.H. 102

LINICAL AND LABORATORY NOTES.

he Provision for Expiration in Endotracheal Insufflation Anæsthesia. By I. W. MAGILL, M.B. 68
cute Ketosis During Pregnancy. By J. HARGREAVES ROBINSON, L.A.H., L.M.R.C.P. 69
ronzed Diabetes: Its Reaction to Dietetic and Insulin Treatment. By E. BOSDIN LEECH, M.D. 69

MEDICAL SOCIETIES.

ociety of Medical Officers of Health: Maternity and Child Welfare Group: Feeding of Infants between the Ages of 1 and 5 Years........... 69

EVIEWS AND NOTICES OF BOOKS.

ncyclopædia Medica. Second edition. Vol. IX., Mammillaplasty to Obesity. Edited by Alexander Goodall, M.D., F.R.C.P.E. 71
Clinical Diagnosis of Internal Diseases. By Prof. Llewellys F. Barker, M.D., LL.D.... 71
Vorlesungen über Diätbehandlung innerer Krankheiten. By Prof. H. Strauss 71
The Nervous Child. By Hector Charles Cameron, M.D., F.R.C.P. 72
Die Lumbalpunktion. By Dr. Martin Pappenheim 72
Lehrbuch der Nervenkrankheiten. By H. Oppenheim 72
Theories and Problems of Cancer. By Prof. C. E. Walker 73
British Journal of Ophthalmology 73
Journal of Industrial Hygiene 73

NEW INVENTIONS.

A Mandible Retractor (Mr. W. Warwick James).—(*Illustrated*) 74

LEADING ARTICLES.

SMALL-POX AND VACCINATION 75
OPERATIONS FOR DISEASE OF THE GALL-BLADDER 75
THE PRACTITIONER'S RIGHT OF APPEAL..... 76
REWARD FOR MEDICAL DISCOVERY 77

ANNOTATIONS.

The Centenary of THE LANCET 78
The Infecting Agent of Exanthematic Typhus.. 78
Acid-Fastness 78
Superficial Sensibility 79
The New B.P. Codex..... 79
Further Discussions on the Diet of the Weanling... 79
An Indictment of Protein Treatment 80
The Children's Sanatorium at Holt 80
Sulphur in the Treatment of Arthritis 80
Committee on the Use of Preservatives in Food.. 81
Legitimate Requirement of Opium 81
Simultaneous Observations on Gastric and Duodenal Secretions 81
Cerebral Cysts........... 82
The International Congress of Surgeons in London.. 82

MODERN TECHNIQUE IN TREATMENT.

XXVIII.—The Treatment of Traumatic Rupture of the Urethra. By G. GREY TURNER, M.S., F.R.C.S. 82

SPECIAL ARTICLES.

Small-pox in Gloucester: Statement by the Ministry of Health.... 92
National Baby Week Conference: Scope, Staffing, and Administration of an Infant Welfare Centre.—Housing in Relation to Infant Welfare 88
Open-Air Treatment of Surgical Tuberculosis: A Visit to Alton......... 89
Medicine and the Law: Liability for Impure Water-supply.—Authority to Engage an Ambulance 89
Vienna: Treatment of G.P.I. by Inoculation of Malaria............... 90
United States of America: Death of Dr. Hermann M. Biggs. — American Medical Association Convention.............. 91

INDEX NOTICE.

THE LANCET, Vol. I., 1923 77

THE SERVICES.

Royal Army Medical Corps.—Territorial Decoration 91

PUBLIC HEALTH SERVICES.

Mental Hospitals Service: Two Scottish Hospitals.—Two Private Mental Hospitals 74
The History of Public Health Effort in Manchester 93
Reports of Medical Officers of Health: Halifax.—Warrington.—West Bromwich. — Guildford. —Leamington Spa.—Shrewsbury.—Watford. —Yeovil............. 93
School Medical Service: Birmingham 94

OBITUARY.

Patrick Whyte Rattray, M.B., C.M., F.R.C.S. .. 95

CORRESPONDENCE.

The Panel Practitioner's Right of Appeal (Dr. J. H. Clements)........ 95
The Prophylactic Treatment of Puerperal Sepsis (Dr. Mary A. Blair) 95
Protein Idiosyncrasy and Asthma (Drs. L. B. Stott and B. R. A. Morton) .. 96
The Lymphocytosis of Infection (Dr. Gordon Ward)............... 96
Tubercle Antigens (Dr. J. A. Shaw-Mackenzie).. 97
Delay in Giving Diphtheria Antitoxin (Dr. Duncan Forbes) 97

MEDICAL NEWS.

University of Cambridge.. 98
University of Liverpool .. 98
University of Dublin 98
University of Manchester 98
Manchester: Care of the Blind in their Homes .. 92
Donations and Bequests.. 95
R.A.M.C. Memorial in Dublin 97
The late Dr. G. L. H. Revill 98
Royal Society of Medicine: Section of Comparative Medicine.............. 98
Postponement of the International Congress of Ophthalmology (1925).. 98
Medical Society for the Study of Venereal Diseases 99
Fellowship of Medicine.... 99
Sixth Congress of the Société Internationale de Chirurgie 99
Condition of Prisons and Internment Camps in the Irish Free State....... 99
Royal Victoria Hospital, Belfast 99
An Asylum in India...... 99
University College, London 99

PARLIAMENTARY INTELLIGENCE.

House of Commons: Industrial Diseases. — Approved Societies and Voluntary Hospitals. —Patent Medicines Legislation.—Pasteurised Milk.—Vaccination and Small-pox.—Tuberculosis in Scotland.—Small-pox and Chicken-pox. — Deaths from Small-pox.—Health Absences of School-children. — Pensioners and Medical Treatment. —Scottish Public Health Authorities. — Selection of R.A.M.C. Officers.... 100

NOTES, COMMENTS, AND ABSTRACTS.

The Welfare of Mental Patients: The Mental Hospitals Association.—National Council for Mental Hygiene........ 103
A Bibliography of Social Hygiene 103
A Detoxicated Photographic Developer 103
A Register Book for Dangerous Drugs.......... 103
Colonial Health Reports .. 103
Insulin "A.B." Brand.... 104
Gas Cylinders in Hot Weather: Safety First 104
A Monograph on Death .. 104

Appointments 101
Vacancies 102
Births, Marriages, Deaths 102
Medical Diary 104

CHRONOLOGIA MEDICA.

Handlist of Periods, Persons and Events in the History of Medicine. By **Sir D'ARCY POWER**, K.B.E., M.B. Oxon., F.R.C.S. Eng., and **C. J. S. THOMPSON**, M.B.E. Cr. 8vo. Cloth. Pp. iv.+278. With 80 illustrations. **10s. 6d.** net, postage 6d.

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Post-Graduate Lectures

ON THE

RGERY OF THE THYROID GLAND.

Delivered at the London Hospital on June 8th and 15th, 1923,

By A. J. WALTON, M.S. Lond., F.R.C.S. Eng.,
SURGEON, LONDON HOSPITAL.

LECTURE I.*

ΓHERE is hardly one, if indeed there is one, subject medicine or surgery of which we can say that ality of knowledge has been reached. The xactitude of our knowledge of the diseases of, or en of the normal condition of, the thyroid is pecially noticeable, and the more we study this oject the more we realise how uncertain are our ws and how we must be prepared to alter them as sh evidence arises. It is manifestly impossible to cuss the whole subject in two lectures; I therefore opose to limit my remarks to the various forms of nocent overgrowth of the gland, for to such lesions rgical measures of treatment are most applicable. ese overgrowths may for convenience be best ssified as follows:—(*a*) Localised: adenomata and ro-adenomata, cysto-adenomata, and pure cysts; Diffuse: colloid goitre, adeno-parenchymatous itre, and exophthalmic goitre or Graves's disease.

If such rare cysts as hydatids are excluded from e first group it will be found that all these lesions mmence as pure adenomata; in the second group e adeno-parenchymatous is simply a combination of lloid goitre and adenomatous masses, although, as shall show presently, there is a definite tendency r a colloid goitre to develop localised overgrowths. ence, as Plummer has frequently insisted, there are ally only three innocent overgrowths of the thyroid, though various combinations of such overgrowths equently occur. These primary enlargements are lenomata, colloid goitre, and exophthalmic goitre.

ADENOMATA.

Pathology.

True adenomatous enlargements commence in a yroid which is previously healthy and are definitely calised and encapsulated. This point must be nphasised because many of the localised overgrowths, pecially those seen in endemic goitre and thus und in association with more diffuse changes, have less well-defined capsule and are, in fact, often not lenomata at all. The true adenomata are frequently ngle, although not uncommonly two or three may e present. They occur in any part of the gland. In e early stages they form spherical masses of solid andular tissue which show already a distinct fibrous apsule. They tend steadily to progress in size, but rely reach the diameter of 1 inch without showing efinite evidence of degeneration. The microscopic udy of a small adenoma will show that it consists f vesicles lined by epithelium, cuboidal or flattened ccording to the size of the vesicle. These are much rger than normal, and may be 10 or 20 times the ze of the vesicles seen in a healthy gland. In nearly ll cases the characteristic feature is the irregularity the size of the vesicles, many small vesicles being acked between those which are enlarged. As the esicles increase the walls atrophy and the adjacent avities run together. It therefore happens that an denoma 1 inch or more in diameter nearly always hows areas of so-called colloid degeneration—that is o say, there are spaces perhaps only as large as a ea, perhaps 1 inch or more in diameter, which are lled with semi-fluid colloid material. This is the rigin of the ordinary cystic degeneration of an denoma, and in some cases the process may progress o far that the whole of the vesicular walls are destroyed and a pure cyst is left, formed of the original fibroid capsule and filled with fluid colloid material. During the destruction of the vesicular walls capillaries may be ruptured and hæmorrhage may take place into the cavity of the cyst. Hence the fluid is either brown in colour or is formed almost wholly of altered blood. At times the hæmorrhage is severe so that the cyst rapidly increases in size, and on removal is seen to contain a large quantity of blood. In the more chronic cases there is an increase of fibrous tissue in the capsule or in the septa. Such a change may be excessive, so that the adenoma in very large part is formed of fibrous tissue, giving rise to the so-called fibro-adenoma. At other times there are calcareous changes within the fibrous tissue, and it is not at all uncommon in old adenomata to find small areas which grate when the tissue is cut and which consist of a calcareous deposit, or sometimes indeed of true bone. This calcareous change may be so excessive that the whole capsule is converted into a stony membrane which does not collapse when the tumour is incised. Another very important and not infrequent change is the formation of the so-called thyrotoxic or fœtal adenoma. Plummer[24] was the first to direct attention to this condition, although Langhans[15] had previously laid considerable stress upon a condition which he described as proliferating goitre. In such fœtal adenomata a naked eye section will show that the tumour has a much more fleshy or granular appearance. In fact, the cut surface will much more resemble that of an exophthalmic goitre than of a normal thyroid. Microscopically it will be seen that the section is made up of solid masses of cells which are often small and embryonic in type, and if arranged in lobules show a very small amount of stroma between. Bloodgood[2] and Goetsch[10] have both called attention to the fact that in the normal thyroid there are two types of cell. There are those forming acini with a more or less definite basement membrane and certain interstitial epithelial cells which lie loosely between the acini. Meleney[23] has shown that it is these interstitial cells especially which are so increased in the formation of the fœtal adenomata. The importance of this change lies in the effects of such cellular overgrowth. McCarrison[16] regards these cells as reserve parenchymatous cells from which new acini are formed as required. In their more embryonic state they may, when they proliferate, not only give rise to hyperthyroidism, but may, indeed, closely resemble in appearance a carcinomatous change. The difficulty in making a differential diagnosis is increased by the fact that not infrequently this variety of tumour does in fact become true carcinoma. Speese and Brown[25] investigated a series of 28 cases of malignant disease and found that 19 of these arose in previous adenomata and that the average time that elapsed before the adenoma showed malignant changes was 12$\frac{6}{10}$ years. It was interesting to note also that in five of these cases of carcinomata toxic manifestations of the adenoma were present before there was definite malignant change. Wilson[27] believes that practically all malignant tumours arise from this variety of fœtal adenomata. In a later communication he[28] investigated the complete literature of this subject and found that there were 193 malignant tumours in a series of 74,335 collected necropsies. Of 97 cases in the Mayo Clinic 50 were only diagnosed by pathological section after removal. Of a further 290 cases in the same clinic only 61 had not noticed a previous thyroid enlargement. He says that if the enlargements are due to circumscribed proliferation of the parenchymatous tissue they are adenomata. If they remain encapsulated and slowly degenerate they are benign. If they are associated with symptoms of slowly developing hypermetabolism with cardiac disturbances they are toxic non-exophthalmic goitre, the toxic adenomata of Plummer. If they continue to proliferate they penetrate their capsule, invade and metastasise, and are then malignant. He points out that histologically it may be almost impossible to differentiate the fœtal adenomata from the carcinoma. He therefore lays down the dictum that any sizable adenoma composed of embryonal tissue, if in a patient of cancer age, is potentially malignant although still contained entirely within the capsule.

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*Lecture II. will appear in a forthcoming issue of THE LANCET.

Ætiology.

Although histologically these tumours appear to be simple adenomata they manifestly differ very considerably in many particulars from adenomata elsewhere. They frequently occur in association with endemic and colloid goitre. As will be shown later they very often have a definite function and may give rise to hyperthyroidism. They also react very considerably with the needs of the body tissue, and thus are often found enlarged during pregnancy and menstruation. The single localised adenomata may possibly be due to the same factors that give rise to more general enlargements, but the evidence on this point is much less clear. There is, however, a very distinct family history. In my own series of 155 operated cases there were 21 in whom other members of the family, usually sisters or brothers, were affected. In such cases there was usually more than one other affected member in the family, and thus it is possible, just as with the endemic and colloid goitres, that this is not an hereditary fault but that all the children and perhaps the parents are exposed to the same faults, whether they be toxic or dietetic. The researches of Kocher and McCarrison seem to show that single localised adenomata are relatively rare in the endemic areas. As with all other varieties of thyroid enlargement the female sex is much more frequently affected than the male. In my own series there were 14 males and 141 females. The age of onset is somewhat later than that of the colloid goitres, and in my own series many first noticed the tumour between the ages of 30–40. Like the colloid condition, however, the change is often first noticed at puberty.

Symptoms.

A small, localised mass occurring in one lobe of the thyroid may be present for many years, and beyond causing the patient a certain amount of annoyance from its unsightly appearance may give rise to no symptoms. Very often, however, a patient who is afflicted, even with a relatively small adenoma, will complain of a considerable amount of pain and discomfort. The majority seek advice chiefly on account of the increasing deformity. In my own series this symptom was complained of in nearly every case, but it was the sole complaint in 30 cases only. When the tumour has reached a considerable size the deformity may be very great, and when it is sufficiently large to attract the notice of the patient's friends may cause considerable annoyance. If pain alone is complained of, it would seem often to be more imaginary than real. The patient will state that there is a pricking sensation in the throat and that there is pain in swallowing. At other times she will complain of pain commencing in the tumour itself, radiating widely up the neck and passing to the head. Only on rare occasions is it noticed, when other symptoms are absent, that there is a feeling of localised heaviness and pressure. If there is a sudden increase in size from the presence of a hæmorrhage, the pain may be considerably increased.

The most important symptom, and the one which most frequently demands intervention, is that of pressure upon the surrounding structures, especially upon the trachea. When the tumour has reached a certain size there is always some dyspnœa; this symptom determines the necessity of operative interference. In some cases it may be very slight or only present upon exertion, so that if the patient is able to lead an easy and comfortable existence it will cause little disability. When the adenoma is placed posteriorly, or if there be two adenomata, one in each lobe, the pressure and resulting deformity is likely to be more marked and the dyspnœa will then be increased. In some cases, indeed, it may have progressed so far before treatment is sought that the patient may have difficulty in sleeping, and may have to lie in bed with her head and shoulders well propped up. If there has been any sudden increase in size, either from hæmorrhage or from some inflammatory change, the dyspnœa will be rapidly increased and may become a serious and dangerous symptom. The condition is much more marked if an adenoma in the lower part of the thyroid has grown downward and become fixed within the thoracic entry. Such a condition, which is usually described as a retro-sternal goitre, is relatively rare. In Berry's[1] series of 500 cases it was only present in 22. Under such conditions the dyspnœa may be most alarming. During expiration the mass may be forced up in the neck and the air may escape with comparative ease, but during inspiration it is drawn down, the trachea is further obstructed, and there is great difficulty in the air entering the lungs. It is well to remember that dyspnœa with a thyroid adenoma may not be due to the visible tumour. A patient may have a prominent adenoma in front of the thyroid and yet the dyspnœa may be entirely due to a second adenoma seated more posteriorly or to an intrathoracic growth which is barely visible. Some of these retrosternal goitres may, indeed, on an ordinary examination, be entirely overlooked, although as a rule they will be pushed up into the neck during forced expiration, such as occurs on coughing. Some, however, may be only diagnosable after an X ray examination of the upper portion of the thorax. Fortunately, these large and more fixed growths have not uncommonly undergone a calcareous change, so that they will give a well-defined shadow on an X ray examination. Other pressure symptoms are relatively uncommon. Now and again patients will complain of difficulty in swallowing, but such a symptom is rare. Occasionally a simple adenoma may be accompanied with alterations in the voice from pressure upon the recurrent laryngeal nerve. It is well to remember this, for it used to be believed that the presence of such symptoms was a clear indication of carcinomatous changes.

Adenomata of long standing are not uncommonly associated with some evidence of hyperthyroidism. Special stress has been laid upon this change, for it has often been claimed that the good results of the surgical treatment of exophthalmic goitre are due to the inclusion of a large number of these cases which can be operated upon with practically no risk. Plummer[24] was the first to clearly differentiate between these two conditions. As a rule the changes do not develop until the adenoma has been in existence for many years. Judd[12] found that in a series of 100 cases the toxic symptoms only developed after an average period of 19$\frac{4}{12}$ years, and in Sistrunk's[26] series only after an average period of 16 years. Haggard and Dunklin[11] found that a large number of their cases developed such symptoms, but they were usually only present in patients between the ages of 35 and 40. They also laid stress upon the fact that such symptoms were very likely to be induced by the administration of iodine, which is so often given to elderly women with long-standing goitre. Although in these cases there is a very definite evidence of hyperthyroidism, this is, as a rule, incomplete. The cardiovascular system is usually more affected, the pulse is increased in rapidity, and later is often irregular; there is evidence of cardiac dilatation, and auricular fibrillation may be present. Although there may be a small amount of tremor the nervous system is always affected to a less degree than in true Graves's disease. It is occasionally stated that there may be some degree of exophthalmos, but in my own series I have never been able to find any true eye changes with a toxic adenoma. It must be remembered here that a patient who has true Graves's disease—that is a cellular proliferation of the whole of the thyroid gland—may also have an adenoma. In such a case which must be sharply distinguished from a toxic adenoma, the characteristic nervous and ocular symptoms of true Graves's disease will be present. In these cases of fœtal adenomata the basal metabolic rate is never increased to the same degree as with true Graves's disease. Haggard and Dunklin[1 found, for instance, that in their series it was raised about 35 per cent., as compared with a 66 per cent. erage increase in Graves's disease. Moreover, er operation it rapidly falls, so that it is only reased by 7 per cent. within two weeks of operation. the later stages there will not infrequently be idence of renal degeneration.

Treatment.

If these adenomata of the thyroid gland were iologically comparable with adenomata elsewhere, operation would be indicated in them all, for being ue tumours no other treatment would be available: ey would steadily increase in size, there would be e danger of sudden enlargement and dyspnœa, d of the onset of malignancy. It has been my aim, wever, to show that in many ways these tumours ffer from true adenomata, and hence the general rgical rules are not applicable. I would regard as dications for operative interference :—

1. *Failure to Obtain Relief by Medical Measures.*—, when first seen, the tumour is associated with a ffuse enlargement, medical treatment should always tried. It may happen that the adenomatous ass will entirely disappear, but even in the ore unsatisfactory cases the general enlargement ill lessen and the size and shape of the adenomata ill become better defined. It is my custom also in l cases in which the adenoma is soft and ill-defined try a course of medical treatment. In such cases e mass is less likely to be a true tumour, and t uncommonly very considerable improvement, if deed not a complete cure, may be obtained by such easures. If, however, the tumour is very hard and arply defined, which usually means that there is ther some degenerative change in the wall of the denoma or that it has been converted into a cyst, en, manifestly, no medical measures will bring about cure.

2. *A Steady Increase in Size with Resulting Deformity.* —If these tumours are very small, and give rise to o disability, no operation need be undertaken, but such cases a careful watch should be kept upon the atient, and this is more especially so if she is over e age of 30. In fact, if a tumour has been in existence for many years, and the patient is 35 years or ore, an operation should be advocated, especially there be the slightest evidence of any toxic symptoms, r it is these cases that are so likely to become alignant in later years. If the tumour is so large hat it causes a definite deformity, operation is clearly dicated. There is, perhaps, one exception to this tatement, and that is if the patient be pregnant. nless there be very urgent dyspnœa, no operation hould ever be undertaken for a goitre during pregancy. It is astonishing to what an extent an normous goitre seen in the later months of pregnancy ay diminish in size within a month or two after he confinement or after the completion of lactation.

3. *The Presence of Dyspnœa.*—This is the chief and ost important indication for operative interference, nd even if it does not greatly interfere with the atient's life it is evident that pressure is being caused nd that the tumour is enlarging. Should difficulty in reathing be so marked, or should the patient's mployment be such that her work is seriously interered with, the necessity for operation will be much ore urgent. If the disease has been allowed to rogress so far that the patient cannot sleep on lying own, the operation should be undertaken as soon as ossible, for at any time an attack of severe dyspnœa ay occur, and if it takes place at night it may give ise to a fatal result before help can be obtained. cute temporary attacks of suffocating dyspnœa are robably due to hæmorrhages and are a clear indication f the urgent need of operative treatment. The resence of a retro-sternal goitre causing dyspnœa will call for interference as soon as possible, for the onger the condition is left the greater the danger and he more difficult the operation.

4. *Other Pressure Symptoms.*—Evidence of pressure upon the recurrent laryngeal nerve, blood-vessels, or œsophagus is usually evidence of the rapid increase in size of the adenoma, and is therefore an indication for removal.

5. *Presence of Pain.*—A complaint of pain without other symptoms is rare, but sometimes it may be an indication of early carcinomatous changes, and in any case, if it be sufficient to cause the patient discomfort, operation should be undertaken at an early date.

6. *Presence of Hyper-Thyroidism.*—Not only are toxic changes a considerable danger to the patient, but, as has already been pointed out, such cases are more likely to undergo carcinomatous change. An operation should therefore be strongly urged. It is remarkable to what an extent the grave discomfort which is caused by the toxæmia will improve by operative treatment. Unless degenerative changes have already been set up in the heart and kidneys the whole of the symptoms will frequently disappear within two or three weeks of removal of the tumour.

In performing an operation upon an adenoma many precautions will have to be taken. As a routine measure ether will always be the anæsthetic of choice. Chloroform for any goitre operation is a dangerous drug. If there be many toxic symptoms large quantities of fluid and a prolonged rest in bed will often be a valuable preliminary of operation. These measures will, however, be discussed more fully when operations for exophthalmic goitre are considered. If there be pressure symptoms the anæsthesia should be very light. Under such circumstances the intratracheal ether held out great hopes, but it cannot be said to have fulfilled expectations. Crotti[3] has laid stress upon the defects of this measure, which he says has often proved unsuccessful because of the necessity of anæsthetising before passing the tube. Extreme hyper-extension of the head is required and occasionally the tube may fail to pass beyond the obstruction. The operation of choice is that of enucleation of the adenoma. In actual practice, however, this is only carried out with very small adenomata. The larger tumours are so firmly adherent and have so greatly thinned out the front of the thyroid that a wedge of this anterior surface is usually excised and the adenoma then shelled out from the thyroid tissue behind. To this operation Berry has given the name of resection-enucleation, and it is unquestionably the operation of choice, for it removes only the tumour and leaves behind all the normal thyroid tissue. After removal the cavity of the thyroid gland is closed with a running mattress suture which obliterates the cavity and completely controls all hæmorrhage. It is always advisable after such an operation to insert a small tube for 24 or 48 hours. No harm is done by such a measure, and the resulting scar is practically invisible. In certain cases where an adenoma is very large and limited to one lobe the tissue of that lobe may be so destroyed that a hemithyroidectomy may be required, but this is only the case in exceptional circumstances. Where the adenomata are many and are associated with a diffuse enlargement, a modification of the wedge resection—which will be described as the operation for colloid goitre—may be requisite. The greatest technical difficulties are found in operations for a retro-sternal goitre. Fortunately, however, these goitres receive all their blood-supply from above, so that the vessels passing down to the goitre can be all ligatured and divided before the removal is essayed. It is in the delivery of the mass from within the thorax that the greatest difficulty and danger may be encountered, for at such a time pressure upon the trachea is greatly increased.

Results of Operation.

The results of operative treatment on these lines are extremely satisfactory. The danger of operation is almost non-existent, and if it were not for the presence of long-standing hyperthyroidism with its cardiac degeneration, or of severe pressure such as is seen in the retro-sternal goitres, there would be practically no mortality. In my own series there were three deaths in 155 cases, and in all these cardiac changes were advanced. The after-results, too, are extremely satisfactory. Single adenomata practically never recur, but if they are multiple, and especially if there be any diffuse change in the gland, a more guarded prognosis must be given. Not only is the mortality of operation very considerably higher, but the adenomata are more likely to recur, so that now and again cases will be met with in which, a year after operation, the goitre is as large as before.

Colloid Goitre.

The colloid goitre, or, as it often used to be called, the parenchymatous goitre, differs from an adenoma in so far as the change is diffuse and not limited to one small section of the gland. Two types of the disease are described, the endemic and the sporadic, but it is probable that there is no real difference in these two conditions. In certain areas, such as Switzerland and in the Gilgit and Chitral Valleys, the work of Kocher and McCarrison[19] has shown that the disease is so widespread that a very high proportion of the population may be severely affected by the disease. It is probable, however, that in these places the same causative factors are only present to a more marked degree. In England the disease is now widespread, and although it is still the custom to describe areas where it is endemic, it is very doubtful whether a much higher proportion of cases is situated in these areas. The actual frequency in England is difficult to ascertain, as so many cases are of a minor degree which do not require any operative interference. More advanced examples form, however, a very large proportion of the cases attending hospital out-patient departments, so that unquestionably the disease is very widespread. In the endemic areas it is a most serious menace. Oswald of Zurich states that 1900 Swiss recruits are discarded each year for low stature, which is due in part to a cretinoid state, and that there were 50,000 cretins recognisable at sight. McCarrison[16] found that in some Himalayan villages the disease was so common that it was difficult to find a man, woman, or child not suffering from the deformity. In India as a whole, at the time he wrote, there were not less than 5 million persons afflicted with goitre, while ½ million was a low estimate of the numbers who suffered from its congenital manifestations. He also states that in some Himalayan villages as many as 60 per cent. of infants still at the breast have been found to be goitrous.

Pathology.

The essential pathological change as found in young girls in England is a diffuse enlargement of the whole thyroid gland. The normal shape is more or less maintained, the surface is smooth with large vessels running beneath the capsule and shows no nodular enlargement. The increase in size may be very considerable, a lateral lobe not infrequently being 5 in. in length and 3 in. in width and thickness. The gland is much firmer in substance, and on cut section has a characteristic appearance. The surface consists of small globules which are visible to the naked eye, the appearance being somewhat similar to that of a sago pudding. It is yellow-pink in colour and not very vascular. On microscopic section there is an enormous increase of colloid material. The vesicles are dilated to 30 or 40 times their normal diameter and are filled with colloid. The material differs from that of a normal gland in that it is much more readily stained with eosin. The lining membrane of the dilated acini consists either of a single layer of cuboidal cells or of cells which have become flattened from the pressure of the colloid. The inter-acinar cells are seen in clumps between the dilated acini and are not increased in number. In England the pathological changes do not as a rule progress beyond this, but if the condition has been long in existence further changes may take place in one of three directions: (1) Degeneration of the thyroid tissue; (2) formation of localised adenomatous masses; or (3) a diffuse proliferation passing on to Graves's disease.

In the first condition the acinar walls may break down, masses of colloid may collect, or there may be evidence of a chronic inflammatory change passing on to fibrosis and even to hyaline and calcareous degeneration. If these degenerative changes proceed to an extreme degree the patient may become myxœdematous and the thyroid will then decrease in size and may be replaced by a fibrous atrophic mass. In long-standing cases it is not uncommon for rounded or circumscribed masses to develop apart from the main tissue of the thyroid. These are sharply defined and appear to be adenomatous, but they rarely have the same well-defined capsule as is shown by the true adenomata. McCarrison regards them as degenerative masses which arise from the inter-acinar cells and a an attempt on the part of the thyroid to replace tha portion which has undergone atrophy. Hence, in the endemic areas large nodular thyroids, which in thi country are often described as the adenoparenchymatous type, are common. The adenomatous masses themselves, just like the simple adenomata, will show varying changes. There may be a colloid degeneration with the formation of cystic-like spaces; there may be masses of fibrous or calcareous tissue or there may be a large cellular proliferation giving rise to toxi symptoms just as in the isolated fœtal adenomata. McCarrison[16] has also shown that in the areas wher the goitre is endemic repeated periods of hyperplasia occur during succeeding springs, the gland reverting in the interval to the colloid state.

Under certain conditions the epithelium lining th acini will proliferate, the amount of colloid materia will diminish, and the whole gland will become much more cellular. The patient will then develop symptoms of hyperthyroidism, and in this country it i not at all uncommon to find cases of true Graves' disease which have commenced as a simple colloi goitre. Wilson[29] and McCarthy[21] have shown quit clearly that there is a very definite relationshi between the amount of hyperthyroidism and th degree of cellular proliferation, so that it is possibl to accurately foretell the pathological picture from th nature of the clinical symptoms. Curiously enough in areas where goitre is endemic true Graves's diseas is relatively uncommon, and Eggenberger[5] says tha in Switzerland at least half of the cases of Graves's disease are attributable to the excessive medica prescription of iodine. McCarrison[16] also has note that Graves's disease is rare in regions where goitr is endemic, and in the Himalayan valleys he ha seen comparatively few cases in ten years, althoug the disease was not infrequent among the Europea residents in such localities.

Ætiology.

An hereditary factor in the colloid goitres is eve more marked than in the cases of adenomata, and i my own series it was present in 11 out of 41 operate cases. A further interesting fact has also been noted there have been several cases in which colloid goitr has been associated with deaf-mutism, and unde such circumstances those members of the famil who were deaf and dumb also showed goitres, th remaining members being free from both disabilities McCarrison[16] has laid special stress upon thi hereditary factor, and he has found that it is especiall common among the Syeds, who, being descendant of the Prophet, are permitted to marry only amon their own sect. He states that this factor is muc more marked in sub-thyroidic persons than others for in the true goitre it is difficult to tell what is th effect of heredity because exciting causes whic produce it in the parent produce it also in the fœtu or the child. The sex influence is a very marked facto but it is of interest to note that in endemic area this influence is only noticed after puberty. In quit young children the sexes are equally affected. In thi country the majority of colloid goitres appear i young girls at the age of puberty, although the chang may persist until long after this age. In my ow series 79 per cent. of the cases occurred in women and in nearly all of these the onset was between th ages of 15 and 20. The close relationship of th enlargement to sexual changes has long been noted Not only is the condition much more common at th of puberty, but there is a tendency for an enlarge- nt of the thyroid to occur during menstruation and a greater degree during pregnancy. This is not ommonly seen in otherwise normal women, but hey are the subjects of goitre the increase in the of the gland is much more manifest. It is well wn that under such conditions there is not only increase in the size of the gland but there is a hyper- ivity, and thus women who suffer from a mild pothyroidism are always at their best throughout course of a pregnancy. Occasionally goitres may found at birth or even in young children. In this ntry such a condition is rare. Berry[1] found that his series of 500 cases the youngest were five girls d 14. In my own series one patient was aged 13 d three were 14. As has already been pointed out, wever, in endemic areas congenital goitres are ite common. Among sporadic cases there is very le definite relationship between the presence of tre in the parents and cretinism in the children. the endemic areas this relationship is very constant. has already been mentioned what a high proportion the Swiss population are cretinoid, and McCarrison s made some very interesting observations in the demic areas in India. He has shown that cretinism es not occur until the second or third generation a goitrous family, and that it appears to be more mmon in certain families, especially those who are -nourished. Consanguinity also plays an important rt. Curiously enough, males were more commonly tinoid than the females, the proportion being of the former to 2 of the latter. This relation is ll maintained even among cretins who are goitrous, t it is less marked, the proportion being 5 to 4. rty-four per cent. of all cretins in these areas are so goitrous, but usually the goitre is acquired bsequently to the onset of symptoms of cretinism. oreover, cretins are more likely to develop goitre an normal children, 70 per cent. over the age of 10 ving also a goitre. The importance of the hereditary fluence is shown by the fact that a goitre was esent in 96 per cent. of the mothers of cretins.

Cause.

The older views that goitre was in some way sociated with the geological formation, in so far as was more common in mountainous districts, have d to be very considerably modified. It was believed at in these areas the water was impregnated with ne and that an increase of this substance was the usal factor in giving rise to the enlargement of the yroid. These views have now been definitely own to be incorrect. Endemic goitre is by no eans limited to mountainous districts or to limestone rmations, and there are many high areas in which itre is practically unknown. An investigation of the nctions of the thyroid is more likely to give a clue the cause of the enlargement. It has long been alised that the thyroid secretion contains a large uantity of iodine. In 1914 Kendall was able to olate the active principle in a crystalline form, and has also been able to prepare it synthetically. e has shown that this substance, which he calls yroxin, contains 65 per cent. of iodine. When ministered it acts very slowly, so that its action oes not commence for many hours, and after it has mmenced continues for about three weeks. In 395 Baumann devised his method of measuring inute quantities of iodine in the thyroid secretion. e was then able to demonstrate that the percentage f iodine contained in goitrous glands was much iminished, although in large goitres the total amount f iodine might be above that of the normal gland. e Quervain[4] has shown that if rats are given hyroid secretion they become hypersensitive to an xygen deficiency. By this means he was able to ork out the activity of the various forms of goitre, nd he showed that the colloid goitres contained uch less active principle than exophthalmic goitres. ggenberger[5] has pointed out that the iodine in the ir and water speedily decreased in passing from the ea coast to the upland interior, and that near the sea there was ten times as much as in Switzerland. McClendon and Williams have also shown that there is an inverse ratio between the amount of iodine in the surface waters and the distribution of goitre. It has thus come to be generally believed that a colloid goitre is due to a deficiency of iodine in the water and food. Such an explanation alone would not, however, account for the much greater frequency of this disease in women and its exacerbation during periods of sexual activity. The work of McCarrison[17] has done much to throw light upon this discrepancy. He has shown that deficiency in feeding has a very marked effect in producing colloid enlargement. Pigeons fed on an excess of fat had an increase in size of the thyroid which was due to colloid excess with little or no increase of the epithelium. If raw onions were added to their diet there was an increase of the acinar epithelium. If the birds were also fed upon cod-liver oil there was a very complete freedom from the development of a goitre. He sums up all his experimental work by showing: (1) That a thyroid hyperplasia is readily produced by the use of a diet deficient in iodine; (2) iodine in minute doses will prevent and cure goitre when administered at the proper time and season. Nevertheless, a goitre will often arise when there is plenty of iodine in the food. In other words, a sufficiency may become an insufficiency under certain conditions. The adequate absorption and assimilation of iodine is influenced by gastro-intestinal infection, and the needs of the thyroid for iodine are dependent upon many factors. Excess of fats, for instance, will increase these needs, but there are many other factors, such as sex, age, puberty, sexual activity, pregnancy, menstruation, infections, seasons of the year, &c. In other words, the goitre is usually due to an inability of the thyroid to avail itself of the iodine which is present, or the iodine is insufficient for abnormal demands.

The importance of infection in increasing the demands of the thyroid for iodine, or in preventing its proper assimilation, has of late had very considerable stress laid upon it. McCarrison has carried out a great deal of work on these lines, and has proved that in many of the endemic areas goitre is due to an infection in the water-supply. He has been able not only to produce goitre in human subjects and animals experimentally, but also able to cure already existent goitres by overcoming the infection which is present. The work of Farrant[6] is also of very considerable interest from this point of view. He showed that the various forms of infection are associated with definite changes in the thyroid gland, the acute infections giving rise to absorption of colloid with infolding of the epithelium and a cellular increase—that is, to a pathological change similar to that found in exophthalmic goitre. This occurs with a bacterial infection, or may be produced in animals injected with a toxin—that is to say, it is an antitoxin reaction. In the later stages, and in the more chronic infections, the gland involutes. Large spaces filled with colloid are formed, which spaces vary in size as new ones are continually being formed. Later on fibrosis occurs, the vesicles are destroyed, the gland becomes cirrhotic, and areas of hyperplasia or fœtal adenomata may be formed. The relationship between these two pathological changes is of very considerable importance, for it will be seen that a goitre of the colloid type may merge into one in which there is a proliferation of the epithelium with consequent hyperthyroidism—that is to say, a simple goitre may pass into the much more serious condition of Graves's disease. The factor which appears most likely to cause this change is the careless administration of iodine. Kocher[14] long ago recognised this, and issued a warning against the treatment of lesions of the thyroid by means of iodine and thyroid extracts. Although the greater part of the evidence at our command suggests that the above is the chief cause of a colloid enlargement, there are certain facts that throw doubt upon it. It has long been realised by surgeons that in those cases where an operation is indicated for the relief of dyspnœa the removal of a portion of the thyroid either in the form of a wedge resection or as a hemithyroidectomy is, in the majority of cases, followed by a rapid diminution in the size of the remaining portion of the thyroid. This, together with the pathological appearance, which consists of dilated acini with deeply-standing colloid material, suggests that the disease is not so much one of overgrowth and secretion of the thyroid, but rather of a damming up of its secretion within the thyroid gland. This would also account for the fact that so many of these cases show a hypo- rather than a hyper-thyroidism. Acting on this assumption in one case presenting dyspnœa, I operated by making a simple incision through each lobe. It was of interest to see that the operation was followed by a diminution of the size of the gland, which progressed into a complete cure. The progress was, however, so relatively slow as compared with that of a wedge resection, that it was not considered advisable to repeat it.

Symptoms.

The disease, as a rule, commences in this country as an enlargement of the thyroid gland, which is first noticed in girls at or about the age of puberty. At first it is very difficult to determine whether the enlargement is only physiological or pathological, and a large number of female children at this age show a distinctly enlarged thyroid which disappears within a few weeks or months. In fact, the size of the thyroid is so variable in women that it is often difficult to say what is its normal size. As the condition progresses the enlargement steadily increases, until it forms a noticeable swelling with very distinct characters. The whole gland participates, so that the normal outline is maintained. At this stage the enlargement is soft and ill-defined, so that on palpation it may be difficult to determine its exact outline. There is no visible pulsation of the overlying veins, there is little or no increase in the pulsation of the arteries, no thrill can be felt at the superior pole, and the enlargement is not tender. In such cases a family history is common. Children in this stage are often brought for advice because a small swelling has been noticed, and because the mother has feared trouble owing to the presence of goitre in other members of the family. Later the most important symptom is that of pressure upon the trachea. There will be the onset of dyspnœa of varying degree. At first this will only be found upon exertion, but later it may be present when the subject is at rest, and it may often interfere with sleep. Such patients may have severe suffocating attacks, and even a fatal attack, of acute dyspnœa at any time of day or night. Under such circumstances it will be found that the trachea is much flattened from side to side, so that it shows the well-known scabbard appearance. It is well to remember also that in such cases of extreme pressure there is not only a flattening of the trachea, but also a loss of elasticity from atrophy of the cartilaginous rings. The importance of this change lies in the fact that sometimes removal of the thyroid is insufficient to overcome the dyspnœa; the operation may, in fact, allow the trachea to collapse. Berry has laid stress upon this fact, and has pointed out that a tracheotomy may sometimes be necessary after a partial thyroidectomy. In my own experience this has only been necessary on two occasions. After the partial thyroidectomy the trachea was seen to collapse with every inspiratory movement, so that there was valve-like action with complete obstruction.

Colloid goitres, being as they are uniform in size and enlargement, are not usually associated with retrosternal masses, and hence dyspnœa from obstruction of the thoracic inlet does not occur. Later the nature of the thyroid enlargement may alter considerably, and there may appear in it nodular masses, sometimes very numerous, giving rise to the so-called adenoparenchymatous type. Under such circumstances dyspnœa may occur from a lateral distortion and displacement of the trachea, and there may be pressure upon surrounding tissues similar in nature to that occurring with the adenomata. As a general rule, a simple colloid goitre of this variety shows no symptoms of alteration in thyroid activity, or if any such symptoms are present they are more likely to be of the nature of a hypothyroidism. The relationship between this condition and cretinism occurring in the endemic areas has been mentioned. Sistrunk[26] has shown that with this variety of goitre the basal metabolic rate is either normal or a little below the normal, and this even if there were a certain amount of tachycardia and nervousness. At times, but usually only after a colloid goitre has been in existence for a considerable period, there may be evidence of hyperthyroidism. The general symptoms are, as a rule, the first to show the change. The patient will complain of palpitations and will be found to have a rapid heart-beat. She will become nervous and tremulous, and there may be slight exophthalmos. The thyroid will then be found to be much more vascular, there will be pulsation of the overlying veins, and often a thrill at the apex of the upper lobe. In other words, the condition has passed over to one of true Graves's disease. It is of very great importance to recognise the earliest onset of such a change, for under such conditions the administration of any form of iodine or thyroid preparation will be fraught with considerable danger.

At times very curious intermediate changes are found in long-standing colloid goitres which are difficult to explain either clinically or pathologically. The thyroid may lose its soft ill-defined outline and may become hard and sharply defined. In such conditions it appears to be adherent to the trachea and may be mistaken for a malignant change. The progress of the disease will show, however, that there is little or no change, and I have seen one such interesting case where the condition has been maintained unaltered for a period of over three years. In another such curious case the patient showed a large hard thyroid with evidence of very slight hyperthyroidism. At operation the gland was of almost stony hardness. Pathological reports of the removed portions stated there was a diffuse carcinoma, for the thyroid cells were found widely dispersed in the lymphatics. The gland remained enlarged and hard after the partial removal, but the patient commenced to develop slight evidence of myxœdema. The administration of small doses of iodine was followed by a rapid decrease in size of the thyroid until now it cannot be felt at all and the patient is a typical example of myxœdema who has to be constantly controlled by the administration of thyroid extract. The onset of true malignancy in cases of colloid goitre is extremely rare, and I doubt whether it ever occurs unless the gland has previously been the seat of multiple adenomata.

Treatment.

The treatment of this disease is in itself essentially medical. If taken at the correct period the enlargement can probably always be controlled by medical measures. This is more especially the case in young children and where there is some definite factor such as pregnancy. Under such conditions no operation should ever be considered unless there be the onset of some urgent complication. The treatment usually advised is the administration of iodine or thyroxin, and in the endemic areas it has been advocated that one of the iodides should be mixed in very small doses with common table salt and should in this manner be distributed to the general population, or should be given mixed with chocolate to young children. Such methods of widespread administration have, however, several drawbacks. Attention has already been directed to the fact that in the endemic areas such cases of Graves's disease that occur are usually due to over-administration of iodine, and there is unquestionably a very considerable danger in giving this drug if there is the slightest evidence of hyperthyroidism. Moreover, the work of McCarrison has shown that some other factor is often present, and that the administration of iodine alone may be insufficient.

investigated a series of out-patient cases on these ines, and the results were very interesting. Twenty ases were treated with regular doses of the syrup of odide of iron and 20 with intestinal antiseptics alone. About 50 per cent. of each group were cured. If the wo treatments were combined a further 40 per cent. were greatly benefited, thus supporting McCarrison's view that an excess of iodine may be insufficiently absorbed if intestinal sepsis be present. There is no doubt, therefore, that each case must be considered apart, and that the administration of iodine will have o be combined with attention to the diet and the care n eliminating any form of sepsis and especially ntestinal sepsis.

There are, however, certain cases in which surgical reatment is indicated, but it must be remembered hat this is always exceptional. The first clear ndication is the presence of dyspnœa. Even in such circumstances an operation should only be undertaken f the dyspnœa is sufficient to cause discomfort, if it is steadily progressive, and especially if it interferes with the patient's sleep. The second indication is the presence of multiple adenomata. Since these masses are not true adenomata but are secondary to the general change, an operation should not be performed unless medical treatment has been tried. Moreover, such measures must always be continued after the operation or the condition will recur.

The onset of hyperthyroidism, if it is not controlled by medical treatment, is also an indication for operative treatment. The case will then pass from this group into that of Graves's disease, where the indications for operation will be more fully considered. In certain cases where the disease has existed for a long period and has proved refractory to all forms of medical treatment, an operation may be undertaken as a means of overcoming deformity, but it must be remembered that such cases are exceptional.

In cases of the above type where an operation is essential the same preparation and the same precautions in the use of the anæsthetic will be taken as in cases of adenomata. It was formerly the custom to to perform a hemi-thyroidectomy, removing one lobe and half the isthmus. There are, however, several drawbacks to this operation. If the thyroid is very much enlarged removal of one side only may lead to an increase in deformity of the trachea, and thus may not only fail to relieve but may actually increase the dyspnœa. As a general rule a hemi-thyroidectomy is followed by a rapid decrease in the size of the remaining half of the thyroid, but in certain cases the other lobe may not diminish or may even increase in size. Under such circumstances the deformity is considerably exaggerated, for a lateral enlargement is more noticeable than one that is symmetrical. The operation, therefore, of choice is that of a double wedge-resection combined with division of the isthmus. Free access is gained to the thyroid gland by means of a long collar incision. The pre-tracheal muscles are preferably divided and the whole of the thyroid is exposed. The isthmus is divided down to the trachea and dissected free, so that all pressure upon this structure is removed. Each lobe is grasped by the assistant so as to control all hæmorrhage. A wide wedge with its base anterior is excised from each lobe in turn, and the wide gap which is left is sutured together with a running mattress suture of catgut which controls all hæmorrhage and restores the lobe to shape. The reconstructed lobes are then dropped back into position, a small tube is inserted, the muscles are sutured, and the wound is closed. Should there be multiple adenomata the wedge will have to be modified, and after the elliptical incision is made in front of the enlarged lobe the individual adenomata will be shelled out with the wedge instead of making a clean incision. If there be any evidence of hyperthyroidism or manifest toxic changes an operation of the above type may be associated with too much risk. Under these circumstances there will be less danger, less trauma and hæmorrhage, if a partial thyroidectomy be performed. These cases should, in fact, be treated not as simple colloid goitres, but as cases of Graves's disease. The same preparations will be made for operation, and the same technique will be carried out.

Results of Operation.

The results of operation in this type of goitre are not quite as satisfactory as those of adenomata. This is due to the fact that an operation is only carried out in the presence of some complication, whereas with an adenoma removal is often called for when the patient's condition is quite good. In my own series of 42 cases there were two deaths. One of these was due to the fact that the trachea was absolutely flattened and after removal showed a valvular collapse on inspiration. An attempt was made to overcome this by intubation of the trachea, but the patient collapsed rapidly and died a few hours later. In spite of the danger of infection of the wound I believe it would have been better in this case to have performed a subsequent tracheotomy as giving a freer air entry. The other case showed a considerable amount of toxic change and hyperthyroidism, although the changes were not sufficient for the case to be included among those of exophthalmic goitre. The more simple goitres will usually make very good progress after operative treatment, but should there be any adenomatous masses it is always necessary to carry out post-operative medical treatment or the enlargement will recur and obstruction again become manifest.

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INSURANCE PRACTICE:

A REVIEW WITH CERTAIN CRITICISMS AND CONSTRUCTIVE PROPOSALS.

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The preparation of this paper suggested itself some weeks ago when the virulent attack was made by a certain medical coroner on panel practice, especially where practitioners were in possession of large panels. Being one who may be classed in that category, I have thought that a brief review might throw some light on a much-abused system. I regret the necessary introduction of personalities.

First it may be pointed out that to a very large extent the routine work of an insurance practice is something new in the annals of medicine. Medical art has more or less in the past been devoted to, if one may use motoring language, the repair of breakdowns; but with the introduction of the Insurance Act, carte blanche was given to any insured person not only to claim the services of his mechanic in a breakdown, but at any time when he thought the car was not in proper tune. There was nothing in the Act to prevent a man claiming Rolls Royce efficiency irrespective of personal abuse or the type of vehicle. Where that could not be obtained, he could grumble about the delinquencies of his mechanic and at the same time suggest that those delinquencies were due to the objectionable system of payment. Further, it is perhaps as well to recall that, previous to the introduction of the Insurance Act, the potentially insured were given to understand that they had merely to report a lack of tune to their medical adviser to draw freely on Insurance funds. As soon as the Act was passed the work of disillusionising them on this point was very promptly and very properly begun; unfortunately, though the politician practised the illusion, the onus of explanation was left to the physician, and too often, when the explanation was not considered satisfactory, the method of payment again came under discussion.

In bringing the work under review real difficulty has been found in fixing some standard on which it could be judged. Obviously, we know next to nothing of what is normal health, or what constitutes a restoration to normal health, for the disappearance of certain disagreeable symptoms does not always mean a status quo ante. On that basis no standard can be fixed. A comparison might be made with the work in private practice, the results in private practice for the time being held out as ideal, but when one comes to realise the number of faith-healing cults, patent-medicine vendors, bone-setters, herbalists, and the whole host of others downwards or upwards to the handy-women with their single box of salve, who had their large clientèle long before the Insurance Act came into force—these, whatever value they may have had, certainly demonstrated that a large number did not find the care of qualified medical men all-sufficient. Comparison is difficult, and more so because failure or transgression in private practice is put down to lack of ability or excusable forgetfulness; under the Insurance Act it is always "the panel." From the fact that the Ministry has asked for a record of the total number of attendances, it would appear that some value is attached to that, but it is the most futile of all standards. It places a premium on eye-service and inefficiency. One consultation of half an hour, where that appears necessary, may be of infinitely more value that 30 of three minutes' duration.

The Standard.

Some standard has been sought within the work itself and the following tests have been applied:—

(*A*) How far (1) loss of patient, (2) permanent disablement, (3) death of patient, may be assigned to (*a*) the system, and responsibility divided between the Ministry and approved societies on the one hand, and (*b*) the art of medicine, and the responsibility divided between the limitations of medical science and personal incapacity or delinquency.

(*B*) How far credit can be given to the system for cure or alleviation of the major illnesses of life acting through the agency of the faculty.

An attempt has been made to present a series of facts in as neutral a spirit as possible and little judgment has been passed, the writer preferring to leave that to others. Where the facts appear personally unfavourable no excuse is offered, for *qui s'excuse s'accuse*. One cannot argue from the particular to the general, but when a series of generalisations are applied to the particular and found wanting, then to a fair mind it suggests the need for revision.

Basis of Review.

Two thousand records of different insurance patients accumulated during a period of slightly over five years, have been examined. During that time the total number of insured patients on the list has gradually increased to slightly over 2500—the limit fixed in this area—and has been subject to adjustment, a process again necessary. This does not represent the total number who have actually claimed benefit. The work on various occasions has been interrupted through absence and illness, but the interruption has always been to all intents complete; mere triviality of illness has not prevented a record being kept, for anyone caring to investigate primary symptoms will find that trivial illness is an expression very difficult of definition. In Table III. the analysis of disability, where this deficiency from the total actually seen has to be acknowledged, the symbol + has been used to represent a proportionate deficiency from some total figure which can be regarded as a constant, the figures thus retaining a relative value. Where the symbol is absent it may be taken that, as far as it has been possible to ascertain, those are the actual number of cases occurring during the period.

Influx and Efflux of Insured Persons.

There are still 836 persons not indexed since April, 1918, but it is worth noticing that since January, 1920, when a new method of notification was introduced, 845 new patients have been accepted. This would suggest that the total number of persons who have to choose a new doctor in any one year, as compared with the number who might be automatically transferred by change of practitioner, must be relatively large. Those figures could be easily obtained by the Ministry, and would be interesting in view of the injury that the new regulations must sometimes inflict on young men with limited capital seeking to enter general practice.

Table I.

Removals from List (304).

Ceased insurance	167*
Left area	81
Transferred by patient's request	33
Transferred at my request chiefly owing to distance ..	23

* 53 have since attended as private patients.

Analysis of Cases Desiring Transfer (33).

Cause not assignable	9
Chronic illness and unable to give relief	5
New address and distance from surgery probable ..	5
Refusal to commit breaches of certification rules ..	3
Opinion resented but still attending rest of family ..	3
Dissatisfied with treatment of private patient—one family	2
Refused to assist admission to local infirmary, one already discharged incurable, the other infectious	2
Pregnancy, and refusal to induce abortion..	1
Four transferences within three years, twice to me ..	1
Objection to locum tenens	1
Transferred by Insurance Committee on charge of negligence	1

Discontent.

Of the 2000 patients, 304 have been removed from this panel. The various causes for the removals have been analysed partly from the notification slips from the Insurance Committee, and partly from notes on the record sheets, and are tabulated (Table I.).

he number of apparently dissatisfied patients ppears trifling, even including the nine* for whom o cause can be assigned, but the number is quite arge enough in any area to give the impression of large amount of discontent. It is surprising to bserve over what a wide area one individual can oise his grievance. It does not appear to do any eal harm. The average working-man has a great eal of sound logic in his make-up and it is very rarely hat he allows his opinion of his medical adviser to e biased by the assertions of others. As individuals e ignore it, and perusal of the list will make it bvious that in certain cases one dare not tell the truth ven if so disposed. It is doubtful if panel representaives are wise in giving it more than the most casual f notice.

Freedom of Transfer.

Insured persons have always been at liberty to ransfer at any moment desired, without questions eing asked. Only once has this rule been broken, nd that was owing to insolence backed by threats nent certification. The patient was transferred at ny request at the first opportunity. Ill-considered esolutions of panel representatives may ultimately ob the average practitioner of opportunities to display ny of the time-honoured professional courtesies.

Record Cards of the Ministry.

When the new record cards of the Ministry were ntroduced their utility was considered, but so far s personal use is concerned they were discarded for he following reasons: (*a*) The space for observations s too small. (*b*) As they are sometimes transferred ocally one has to exercise great discretion as to what one commits to paper. They are not privileged, either is there any penalty for the divulgence of the emarks on them to the patient. (*c*) Records should still be of value even after the death of the individual, and the records of the Ministry are lost to the practiioner. (*d*) The observations of others are of doubtful value, as they may prejudice unfairly one's views of a patient's symptoms.

Certification.

Certification as a cause of needless friction and interference with medical benefit cannot be fully discussed here. Much has been made of the overcrowding of surgeries, and the following figures are worthy of consideration. The average daily number of patients attending surgery while incapacitated was taken over a period of five weeks. The consecutive figures for an average week were, 4·8 ; 2 ; 5 ; 1 ; 13·8 ; 2·6. Subordinate officials are not responsible for this state of affairs, neither can practitioners avoid it. Approved societies and the Ministry must share the responsibility between them. It is not purely a local phenomenon. The whole question of certification should be brought under review by the General Medical Council before support is lent to the complaint of Government departments in regard to the laxity of certification. It is surely possible to devise some form of certificate the signing of which would be compatible with self-respect.

Disability.

To analyse the value of the work Table III. has been drawn up to demonstrate (1) the nature of the disability; (2) operative interference; (3) permanent disablement; (4) death. An analysis of the causes of death in the various age-groups is given in Table II. The causes operating to produce disabilities have received much consideration especially in regard to "responsibility," whether it rests with the individual or to some factors quite beyond his control. In the study of preventive measures it is impossible to ignore this. As one's experience grows so does the impression grow that the accidental has as little relationship to the development of disease as the miraculous has to its cure.

TABLE II.

Analysis of causes of death in age-groups.	Age.						Total.
	16–25.	26–35.	36–45.	46–55.	56–65.	66 +	
Old age (over 70)	—	—	—	—	—	10	10
Malignant disease	—	—	1	4	3	1	9
Heart, diseases of	—	—	1	1	2	4	8
Phthisis	2	—	2	1	2	—	7
Pneumonia	—	2	—	1	3	—	6
Vascular lesion	1	—	—	1	2	1	5
General arterial degeneration	—	—	—	—	3	2	5
Kidney, diseases of	1	1*	—	—	1	—	3
Unknown	—	—	—	1	—	1	2
Dementia	—	—	—	1	—	—	1
Parotid abscess	—	—	—	1†	—	—	1
Cellulitis and malignant endocarditis	—	—	—	—	1	—	1
Insular sclerosis	—	1	—	—	—	—	1
Tetanus	—	—	—	1*	—	—	1
Huntingdon's chorea	—	—	—	1‡	—	—	1
Total	4	4	4	13	17	19	61

* Died in hospital. † Certified by deputy.
‡ Post-mortem obtained.

In addition, 10 died of influenza during the epidemic, 1918–19. (Vide Brit. Med. Jour., 1919, ii., 519.)

For the purposes of this paper the disabilities have been divided into various types, more or less arbitrary; they suggest that the inter-relationship of those types and the relationship to the history of disease would form an interesting study. Unfortunately, its study is surrounded with many difficulties; a method to overcome some of these difficulties has been devised, but has not been in operation sufficiently long to prove its worth.

TABLE III.

Analysis of disabilities.	Total.	Operations.	Permanent disablement.	Deaths.
Respiratory	805 +	—	—	10*
Alimentary	519 +	25	—	—
Superficial integuments	284 +	4	—	—
Pain without associated symptoms	179 +	—	—	—
Ear, throat, and nose	171 +	8	—	—
Diseases of women	100 +	6	—	—
Muscles, bones, and their attachments	85 +	4	3	—
Circulatory	81 +	—	7	13
Subjective symptoms only	58 +	—	—	—
Disabilities due to war	42	—	2	2
Diseases of heart	37	—	2	8
Eye	34 +	2	1	—
Pneumonia	31	—	—	6
Neurosis, including epilepsy	29 +	—	1	—
Polyarthritis	20	—	—	—
Syphilis	19	—	1	—
Phthisis	18	—	3	7
Tuberculosis other than phthisis	16	5	2	—
Gonorrhœa	15	—	—	—
Genito-urinary, men	14	3	—	—
Chlorosis	13	—	—	—
Pleura	11	1	—	—
Malignant disease	10	2	—	9
Exophthalmic goitre	4	—	1	—
Lunacy	4	—	—	1
Scarlet fever and measles	3	—	—	—
Insular sclerosis	2	—	1	1
Glycosuria	2	—	—	—
Aneurysm	1	—	—	—
Chorea	1	—	—	—
Rodent ulcer	1	1	—	—
Tetanus	1	—	—	1
Huntingdon's chorea	1	—	—	1

* All influenzal.

It is necessary to explain that where a similar illness has occurred in a patient, irrespective of the interval between the attacks, it has been given one value. Violence has not been included. The respiratory type is abnormally inflated owing to the epidemic of influenza which occurred during the period under review. The number was not definitely ascertained; a rough estimate places it over 400.

Glycosuria.—These do not include some cases of very transient glycosuria. Routine analysis of urine is carried out and Fehling tested to excess. Of the two, one is known to have had the condition for over ten years and the other two years. Both can be controlled by diet.

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* The number was originally 11, but since commencing this paper, in two cases favourable opportunities have arisen for inquiry, and in both cases, marriage and removal from this neighbourhood was found to be the explanation.

Operations.—From a popular point of view the most satisfactory feature of the work has been the operative. I have the greatest pleasure in recording this fact, as none of the operations have been carried out personally. Of the 25 alimentary cases, 20 have been for appendicitis with 100 per cent. recovery. All showed evidence of inflammatory trouble. The small number of operations for malignancy is surprising. In one or two cases operation might have been possible if diagnosis could have been made earlier, but in two cases where the condition was very early suspected, the suggestion of laparotomy made them go elsewhere. One, a prominent society official, died under the care of a colleague, and the other again called me in consultation four days preceding death.

Additional Advice.—A considerable number have had the advantage of the opinion of consulting physicians or surgeons, and a large number have on occasion sought the advice of colleagues. Not a few have returned to ask me what I thought about it. One man whose only complaint was pain in the great toe and who died from a sarcoma of the pelvis, consulted "nine doctors and four herbalists" and called to give me the opinion of each. As to the more extensive utilisation of specialists, I have found no difficulty in obtaining their opinions as the need arose—through charitable institutions, or through private consultation where the patient could obviously afford it. Too easy access might tend to lower rather than raise the standard of work, and could easily be carried to absurdity.

Improvement of the Service.—Perhaps the ideal system of treatment would be large individual units where a practitioner could be in the financial position to pay for specialised assistants. For obvious reasons this is not a course likely to be favoured by the Government or approved societies. Their desire to increase the number of practitioners in an area and diminish their individual financial resources is sound tactics, and as politics go, one can overlook the assertion that it has anything to do with the question of efficiency or the advancement of medical science. It is more likely to retard it, so that as an alternative the following suggestions are made.

Diagnostic Centres.

Some method should be devised to bring the work of the consulting room into as close a relationship with physiological and biochemical laboratories as exists at the present time between the wards of a general hospital and the pathological department. It is doubtful whether when we fail to attach a name to a particular disability we are dealing with some unnamed disease. It is more probable that we are really dealing with those processes in a history of illnesses which is usually slurred over as ætiology. It is true that under the present method of certification we have to attach a name to those processes, and one can agree with Rowand of St. Andrews, that to do so is demoralising. We can gather the symptomatology of those cases, but the explanation will, I think, in many cases, be found in the laboratory.

While some of us may feel that we are doing better work by spending some portion of each day in the laboratory rather than running up an indefinite number of visits and consultations, we can never hope to be as proficient as the specialised laboratory worker. On the other hand, it must be rare to find a laboratory worker as skilled in the elicitation of symptoms as a skilled practitioner. There is, therefore, a great need for coöperation between the two. One would suggest that diagnostic centres should be opened up where a patient could be admitted for a few days and during that time remain in touch with his practitioner. This would get rid of the odium attached to the suggestion that one was too lazy to diagnose one's own cases. One cannot see the work going on in clinical laboratories without appreciating how much it is required. Its value has still to be proved, and even if proved, it may mean a new race of practitioners before it will come into its own. But a beginning could surely be made on a sma scale as an adjunct to teaching centres.

A Department for Medical Research.

Under the Act there has been established a counc for medical research, but the suggestion put forwar is for the establishment of a department directl interested in the research work carried out in genera practice. It may be urged that the amount of suc work is now small. That may be true, but it certainl lacks both assistance and encouragement. It is no good that the ambitious young student should fee that by entering insurance practice he is entering a inferior service with a dead end, and a council of me of mature experience and wide sympathies is muc required to assist young graduates during those year when the desire for research is strongest. "Much, said Dr. Johnson, "may be made of a Scotchman, i he be caught young," and the same might apply t the general practitioner. The department coul become a great reservoir of knowledge, giving advic when asked, and supplying information when desired

Much that requires investigation will mean researc and observation over a life-time, and unfinishe work, without such a department, is likely to be lost While such work might prove of value to those wh follow after, yet it might not be considered worthy o publication in the limited space of medical journals Even that which has been on wrong lines might sav some future worker from a similar error. All thi must be voluntary, but the resources of the department should be open to anyone wishing to utilis them. The names should not be known to any loca committee. The compulsory keeping of record might be abolished ; the value of such records mus be very slight, and the labour and finance save might be applied to the purposes of this department

Halifax.

THE CAUSE OF DEATH IN INTESTINAI OBSTRUCTION.*

By SETON PRINGLE, F.R.C.S. Irel.,
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The cause of death in intestinal obstruction i still a subject for debate, and is a problem which ha been constantly before my mind during the pas 20 years, each year calling out with greater urgenc for solution. Three theories have been advanced (1) Infection—i.e., escape of organisms through th wall of the obstructed intestine, causing peritonitis (2) absorption of toxins from the obstructed intestine ; (3) depletion of systemic circulation an cerebral anæmia. I have frequently asked mysel whether one of these three was the correct explanation or whether each contained part of the truth ?

Toxæmia the Most Constant Factor.

As experience increased with years, I found tha the infective theory would only account for a ver small proportion of the deaths, most cases dying lon before there was marked peritonitis, and I graduall came to look on toxæmia as being the most constant—and probably the causal—factor, but man points still remained at issue. For instance, found it impossible to reconcile with the toxæmi theory the fact of the sometimes rapid death i strangulation where, presumably, the absorptio from the strangulated loop cannot be great on accoun of the obstructed venous return. Can the toxæmi in these cases arise from absorption from the intestine above the strangulated loop—intestine whic was in a condition of simple obstruction ? Does th factor of shock and reflex dilatation of the porta system occur in these strangulation cases, thu accounting for the greater rapidity of death ? Again is death in peritonitis due to septic absorption, or i it not often chiefly due to the absorption of toxin from the paralysed and distended gut ? In th absence of time and facilities for experimental work, I recently turned to the very extensive literature on the subject, and I think a résumé of the results may perhaps interest other surgeons.

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* Read before the Surgical Section of the Royal Academy o Medicine in Ireland on March 9th, 1923.

I found that a tremendous amount of work had been done, chiefly in America and on the Continent, and that, as a result of all this work, two facts stand out clearly and confirm our clinical experience: (1) Peritonitis is not the chief factor in causing death, which often occurs before its onset and almost always before it is extensive; (2) the higher up the obstruction, the more rapidly is it fatal. For example:

Dogs [1]	obstructed in the	rectum live	28 days.
,,	,,	,, ileo-cæcal valve live	14 ,,
,,	,,	35 cm. below pylorus live	7 ,,
,,	,,	2nd stage duodenum live .	2 ,,
Rabbits [2]	obstructed	in colon live	10 ,,
,,	,,	in lower ileum live ..	4–5 ,,
,,	,,	at end of duodenum live	17 hours.

As regards the other results obtained, the weight of evidence is all in favour of death being due to a toxæmia resulting from absorption of a toxin, or toxins, from the obstructed intestine, and the efforts of most workers have been directed towards discovering the site of production, the nature and the source of the toxin.

Site of Production of the Toxin.

The fact being established that the higher up in the small intestine the obstruction occurs, the more rapid is death, the attention of most observers was focused on the duodenum. It has been shown that if the second stage of the duodenum be obstructed,[3] or if a loop of the duodenum be isolated, closed at both ends and its blood-supply left intact,[4] death occurs in a very few days with the symptoms of toxæmia—i.e., dullness and apathy, tachycardia, muscular weakness and tremors, renal suppression, vomiting, temperature disturbances, and fall of blood pressure; whereas a similar isolation of a loop of ileum is compatible with life for many weeks, death occurring not from toxæmia, but from rupture of the loop and peritonitis.[5 6] If, however, the loop above the obstruction be drained externally or into the intestine,[3 7] or if the loop be kept washed out, the animal survives for a much longer period.[8] Again, if the contents of an isolated duodenal loop be heated to 60° C. for an hour, filtered, and then injected either intravenously or intraperitoneally, rapid death with the same symptoms ensues,[4] and, moreover, dogs can be immunised against this toxin by the injection of gradually increasing doses.[9] Again, if the duodenum with the bile and pancreatic ducts be transplanted so that it drains into the ileum, and then some weeks later the jejunum be obstructed high up, dogs will survive for more than twice as long as dogs in which the duodenum has not been transplanted before obstruction is produced.[1]

These results go to prove that the duodenum and its appendages, the liver and pancreas, not only produce the toxin which causes death with symptoms similar to those of intestinal obstruction, but produce it in far greater quantities than any other part of the intestine.

Nature of the Toxin.

The nature of the toxin has not been definitely settled. It is, however, generally accepted that it belongs to one of the groups of poisonous chemical substances produced by the disintegration of protein—e.g., proteoses, amines, neurines, and cholines. Several groups of observers have been able to isolate a proteose in an almost chemically pure state from the contents of obstructed duodenal loops.[10 4 9 1] An injection of this proteose produced rapid death with the train of toxic symptoms already enumerated. The probability, however, seems to be that a whole series of the end-products of protein are present in the obstructed intestine, and are active in producing death.[11]

Source of the Toxin.

In considering the possible source of the toxin three different possibilities have to be considered: (1) food; (2) duodenal secretion, either alone or with the bile and pancreatic juice; and (3) products of bacterial action on the intestinal content. Before discussion of the points for and against each of these possible sources, it may be stated that experimental work has so far failed to demonstrate clearly the origin of the toxin. It is generally accepted that it is not derived from the protein of the food, for it has developed both in a loop above a simple duodenal obstruction produced in dogs that have fasted for many hours,[3] and in an isolated duodenal loop which has been carefully washed out before being closed off.[4] As against bacterial origin for the toxin, many points can be urged—e.g., the higher up the obstruction, the more rapid is death, yet the less is the bacterial content. And, again, the isolation of a duodenal loop which contains few, if any, bacteria, is rapidly fatal, whereas the isolation of a loop of ileum, or even of colon,[12] with their numerous organisms, is not incompatible with life for a long period. Many workers, however, [13 14 15 16] cling to the bacterial origin of the toxin, and advance many arguments in its favour—e.g., it has been shown that the fresh secretion of the normal duodenum from which food is excluded is non-toxic, and remains non-toxic if kept under conditions which inhibit bacterial growth, but if it is incubated with its own bacterial content, a toxin rapidly develops, injection of which causes symptoms like those following the injection of the fluid from obstructed loops.[11]

Others—especially Draper, who has operated on many hundreds of dogs—maintain that the toxic substance is a normal secretion of the duodenum and its appendages, the liver and pancreas; that normally it is detoxicated or neutralised by the jejunal and ileal mucosa lower down, but that in obstruction this is prevented, and that, instead, it is retained in the duodenum, is absorbed, and produces the typical toxæmia. In confirmation of this he showed that when dogs with duodenal obstruction are fed with the mucosa of jejunum or ileum from normal dogs, the obstructed animal survived for twice as long.[17] Others have demonstrated that the toxic contents of obstructed loops which cause rapid death on intravenous or intraperitoneal injection, produce no deleterious effects on injection into the intestine of normal dogs.[18] He therefore believes the toxin to be biochemical in nature, similar to prosecretin.

Subsidiary Factors.

In discussing the nature of the toxin it is of interest to note the close resemblance between the symptoms of acute pancreatitis and those of high intestinal obstruction, especially as it has been shown by the following experiment that the presence of pancreatic secretion in the duodenum is necessary for the production of the toxin. (1) If the duct of the pancreas be tied, and then some weeks later high duodenal obstruction be produced, the dog will live about twice as long as when the pancreatic secretion is reaching the duodenum, and that under these conditions a choline—not a proteose—is found in the loop.[7] (2) Obstruction immediately above the pancreatic duct is much less rapidly fatal than obstruction immediately below.[8] As regards the rôle of the bile, Draper showed that the rapidity of death from duodenal obstruction was not influenced by the presence or absence of bile.[8]

While, as already stated, the toxæmic theory of death is generally accepted, yet there are not wanting those [22 2 19] who hold the third theory I mentioned—namely, depletion of the systemic circulation, dehydration of the tissues, and cerebral anæmia brought about by (*a*) shock, producing reflex paresis of the splanchnic area with engorgement of the portal system; (*b*) hypersecretion of fluid into the intestine, and (*c*) vomiting. These three phenomena certainly occur, but I think that the first—i.e., shock—is the only one which is a real though variable factor in the production of death, and that the other two are a direct result of the presence of poisonous substances in the intestinal tract and circulation. The supporters of the theory point to the markedly beneficial result of the introduction into the systemic circulation o large quantities of saline, but, taking all the available facts into consideration, I believe this beneficial result can be better explained by considering that the saline acts, chiefly at least, by diluting the toxin in the circulating blood. It has been shown[17] experimentally that injection of pilocarpine for four days, fasting for seven days, or duodenal obstruction for three days, each produces a relatively equal reduction of the quantity of water in the tissues, and yet no serious toxæmic symptoms follow either the pilocarpine injection or the fasting, whereas duodenal obstruction causes death as described above in three days. The only experimental work done on this subject in the British Isles of which I can find a record is that of Wilkie, of Edinburgh.[2] He concludes that the chief factor in producing death is dehydration of the tissues, and he bases this conclusion on the fact that, working chiefly on cats, he was unable to produce death by injecting the contents of obstructed loops into other cats. Another observer[20] has, however, found that although cats develop in obstructed loops toxic bodies similar or identical with those already described, yet they seem to be immune to injection of these bodies, though injection of the same toxic bodies obtained from cats is rapidly fatal to dogs with characteristic symptoms.

Conclusions.

I think we are justified in drawing the following conclusions from all this experimental work :—

(1) The principal factor in causing death in intestinal obstruction is a toxin which is developed chiefly in duodenum, and, although not absorbed from normal intestine, is absorbed under the conditions which prevail in obstruction.

(2) The exact chemical composition of the toxin is still under dispute, but it is almost certainly of the nature of one or other of the toxic bodies derived from protein disintegration.

(3) The exact mode of production of the toxin is also undecided, but probably the presence of pancreatic secretion, and, in a lesser degree, the activities of bacteria are necessary for its production.

(4) While the duodenum is the site of maximum toxicity in obstruction, yet the poisonous substances are developed lower down in the intestine, and it is probable that in the production of these toxins bacterial action plays an important rôle—a rôle which increases in importance the lower down the obstruction occurs.

The value of all this work and the conclusions drawn from it must finally be decided by clinical results. Do the above conclusions hold true if examined in the light of clinical experience? I believe that, for the most part, they do. In the first place, the great majority of surgeons, as the result of clinical experience and quite apart from any experimental work, are agreed that toxæmia is the chief cause of death in intestinal obstruction. Again, all are agreed as to the great benefit of large saline infusions in obstruction cases—a benefit which can be better explained by the toxæmic than by the systemic dehydration theory. Still more strongly in favour of the toxæmia theory is the fact that stomach lavage, useful as it is in all obstruction cases, is most useful in acute dilatation of the stomach. Post mortem, in most fatal cases of this condition, the duodenum is also distended, so that the functional obstruction, whatever its cause, almost exactly reproduces the conditions of many of the experiments on which the toxæmic theory is based, and the benefit of lavage may therefore be explained by the removal of the toxins generated. The same remarks apply to the well-known good results following lavage in those cases, sometimes following gastro-enterostomy, where there appears to be a temporary obstruction (probably functional and due to trauma at the operation) to the on-flow of the gastric and duodenal contents.

However, although I believe that toxæmia is generally the chief factor in causing death, yet I think it is rarely—if ever—the only factor. Nor does this theory explain the phenomena of many obstruction cases, for instance, in the cases of rapid death, which sometimes follow acute strangulation, the toxæmia can only be of minor importance. In strangulation we have two distinct conditions: a closed loop from which the circulation is cut off, and, above that, a part of the intestine in a condition of simple obstruction. Toxins, if formed in the closed strangulated loop, cannot be freely absorbed, while death occurs in some of these cases long before there is time for any great amount of toxin to be developed in the simply obstructed intestine above the strangulated portion. Such deaths must be due to shock. Again, it has been a common experience of mine to find on closely questioning the patients in ordinary cases of strangulated hernia that he or she vomited coincidently with the onset of pain, and then perhaps six or eight hours elapsed before any more vomiting occurred. I believe the early vomiting to be due to the temporary shock, and the later to toxæmia. For these clinical reasons, therefore, I think that shock is a more important factor in causing death than the experimental work leads one to believe, and that in some cases of strangulation it is the chief factor, producing, among other conditions, an engorgement of the portal system.

Finally, I would like to suggest that intestinal toxæmia has a large share in causing death in acute septic peritonitis. I have long believed that the fatal result is not due in most of these cases to the absorption of the products of the suppurative inflammation of the peritoneum—the symptoms preceding death are generally those of intestinal obstruction, not sepsis. To my mind, there are three factors at work in acute peritonitis: (1) shock, (2) septic absorption from the peritoneum, and (3) toxæmia from the intestine, the involved part of which is generally in a condition of paresis, producing obstruction. These three factors must be constantly increasing as the inflammation spreads. I would argue that, if the shock and toxæmia be combated, there is a possibility of prolonging the patient's life sufficiently to give the wonderful fighting powers of the peritoneum a chance of dealing with the infection. I believe that I have saved what appeared to be quite hopeless cases by not only using morphia and saline-glucose infusions to combat the shock and toxæmia, but also by directly attacking the source of the toxin by means of an enterostomy high up in the small intestine. The operation I have performed is after the manner of a Witzel's gastrostomy—a No. 12 soft rubber catheter is inserted into the lumen of the intestine through a small puncture and fixed in position by a single catgut stitch, the next couple of inches are buried in the intestinal wall by a continuous in-folding stitch, and the proximal end is passed through a hole in the omentum, as described by Mayo,[21] before being brought out through the abdominal wall. To the end of the catheter a long tube is attached to drain into a bottle beside the bed. An enterostomy after this fashion allows free escape of the toxic intestinal contents, and, at the same time, permits the introduction of saline and glucose. When the necessity for drainage is over the tube can be removed, and as the opening into the intestine is valvular and the "sealing-off" properties of the omentum have been utilised, little or no escape of intestinal contents occurs, and all excoriation of the skin is avoided.

The results I have obtained by this method are most encouraging, and I am convinced that its use in selected cases is well worth further trial, especially as it is founded on what appears to be a sound experimental basis.

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(*Continued at foot of next column.*)

A CASE OF
INSPIRATORY APNŒA IN A NEW-BORN INFANT.

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(*With Pathological Report by*
THOMAS W. LUMSDEN, M.D. Aberd.)

WE desire to record the case of a new-born infant in which there were unusual respiratory symptoms, and, as the pathological appearances in this instance were apparently similar to results obtained by Lumsden in experiments on the cat in connexion with the respiratory centres, we deemed it advisable to report the clinical symptoms and the pathological findings of this case in full for the purpose of a comparison.

The Case Described.

Birth.—The mother, aged 25, was delivered of her first child (a male) on March 18th of this year. The infant was two weeks premature. There was nothing of special interest in connexion with the birth, the labour occupying about 12 hours, but with only two to three hours' real pains; the child was born without any interference of any kind and was found to be normal in every way when examined after birth. The head did not show the slightest sign of injury. Although breathing became established immediately after birth the infant looked distinctly cyanosed for a time.

First Attack of Apnœa.—The child appeared to be normal in every way on the first day; it was rather restless on the second night after birth, and on the third day did not appear to be quite well, although so far certainly not definitely ill. About 11 A.M. it was noticed to have a sudden cessation of breathing for a short period with cyanosis, followed by resumption of normal breathing. Artificial respiration was resorted to. Several such attacks occurred at intervals.

Examination: Further Attacks.—When the child was seen by one of us (B. M.) within two hours of the first attack it appeared to be in every way a very fine specimen of a baby. On examination a little rigidity of the right arm and leg was discovered. Shortly afterwards a few twitchings were noticed in the right hand (within half an hour the same thing was observed in the left hand). The breathing at this time was perfectly normal. The child had passed meconium several times, which macroscopically showed no abnormality, and no blood was visible. The little patient had been fed by breast and had also been given Glaxo. Quite suddenly, the infant took a little deeper inspiration than usual and then ceased breathing. Cyanosis soon appeared which gradually became more marked. After about 20 seconds there were two or three short irregular respirations, after which normal breathing became re-established and the cyanosis passed off. During this period there were no convulsions or twitchings. The examination of the patient was then continued. There was no sign of congenital heart disease, nor atelectasis; the air entry into the lung was free and expansion good over all parts of the chest. Nothing of clinical importance was found in the abdomen, pharynx, nose, or neck. There was a very slight yellow tint on the skin, but practically no more than ordinary icterus neonatorum. There were no petechiæ. No increased pressure was felt at the anterior fontanelle. Signs of injury, hæmatoma, meningocele, or any other abnormality were absent. The temperature was normal. No ear discharge was apparent. Urine was freely passed, and the child had passed two motions in the 24 hours.

Within 15 or 20 minutes another attack was witnessed, much similar to the last, with the exception that the attack lasted for about 10 seconds, when breathing was again re-established. During this attack the eyes seemed to slightly point to the right and upwards for a few seconds. The tongue was normal and nothing unusual was seen in the face or position of head.

As the examination of the lungs, trachea, pharynx, and circulatory system elicited nothing to explain the condition, and Buhl's disease being in no way suggested, the symptoms seemed to be due to damage to the brain, most likely of a hæmorrhagic nature in which the respiratory centre was specially affected. The symptoms also suggested that the cortical or subcortical tissues of the left side of the brain were likewise implicated to some extent.

In the event of further attacks the nurse was instructed to perform artificial respiration, give oxygen, and sprinkle cold water on the chest. Tincture of belladonna was prescribed as a stimulant to the respiratory centre. Eight drops of brandy in a teaspoonful of water were to be given between attacks if required.

The infant seemed better for two hours, but then attacks of apnœa appeared again, the respiration ceasing in the inspiratory position for varying periods, with the appearance, as before, of cyanosis, and its disappearance after respiration had become re-established. If apnœa terminated spontaneously, it was broken by two or three short inspiratory gasps; these were succeeded by a further period of apnœa or by normal breathing. There were occasions when the baby slept for as long as one and a half hours at a time, breathing normally and appearing to be quite well. It would then wake up and have twitchings or a mild convulsion which were more marked on the right side. On one occasion, when the baby was lying on its right side, a convulsion began with a movement upwards of the eyes; at the same time the head was lifted from the pillow. When the attacks were over the child seemed exhausted but breathed normally. No definite sequence could be made out between the apnœa and the convulsions, as sometimes the one occurred without the other, while at other times they coincided. Each seemed independent of the other. Later on in the day the convulsions became more generalised and were heralded with a small "meningeal cry."

Death.—When artificial respiration was performed for the apnœa the latter was always cut short and normal breathing quickly re-established. Between the attacks the baby still looked normal. About 8 o'clock on the same day (that is, the third day after birth) the child, having just had a good quiet sleep, became apnœic, but resumed normal breathing with the assistance of a little squeezing. It was apparently lying quietly, its appearance for the moment giving no immediate cause for alarm, when it gave one deep inspiratory gasp and died.

It may be stated that no drugs had been given to the mother either immediately before or during labour, but a few whiffs of chloroform (insufficient to remove consciousness) were administered just before the birth.

An Experimental Parallel.

There have recently appeared some most interesting and cogent observations by Lumsden, who has investigated the respiratory centres in the cat, and his results seem to help materially in the elucidation of this case. In order to make the matter clear we are inserting, by kind permission of the editor of the *Journal of Physiology*,[1] two of his diagrams. He states:—

"The theory generally held is that the automatic respiratory centre is in the lower part of the bulb, and that the regulation of impulses sent out by it is determined by impulses passing to it."

The following are his conclusions:—

1. "In the cat the central respiratory mechanism consists of: (*a*) A part below the striæ acousticæ which when working alone causes gasping respirations. The nerve cells producing this effect may be spoken of as the gasping centre. (*b*) A part at the level of the striæ acousticæ which sends out impulses causing a series of prolonged inspirations. The prolonged inspirations may be called apneuses and the nerve cells producing them the apneustic centre. (Apneusis indicating a holding of the breath in the inspiratory position.) (*c*) A part in the upper pons region which periodically inhibits the activity of the apneustic centre and so produces normal respiration. The nerve cells having this effect may be called the pneumotaxic centre.

2. The posterior corpora quadrigemina have in the cat no appreciable influence on respiration.

(*Continued from preceding column.*)
6. Bunting and Jones: Jour. Exp. Med., July, 1913.
7. Sweet, Peet, and Hendrix: Annals Surg., 1916, lxiii., 720.
8. Draper Maury*: Amer. Jour. Med. Sc., May, 1909.
9. Whipple, Stone, and Bernheim: Jour. Exp. Med., 1914, xix., 144, 166. Whipple and Others: Ibid., 1916, xxiii., 123. Whipple and Cooke: Ibid., 1917, xxv., 461. McQuarie and Whipple: Ibid., 1919, xxix., 397.
10. Rogère: Presse Méd., 1911, Nov. 1st, 1.
11. Stone and Davis: Jour. Exp. Med., 1917, xxv.
12. Blake and Brown: Annals Surg., 1907, xlvi., 568.
13. Murphy and Vincent: Boston Med. Jour., Nov. 2nd, 1911.
14. Dagstedt and Others: Jour. Exp. Med., 1917, xxv., 421; 1918, xxvi., 359; 1919, xxx., 109.
15. Kukula: Arch. f. Klin. Chir., lxiii., 773.
16. Clairmont and Ranzi: Ibid., 1904, lxxiii., 696.
17. Draper*: Jour. Amer. Med. Assoc., September, 1914, lxiii., 1079.
18. Stone: Surg. Gyn. and Obs., May, 1921, 415.
19. Braun and Boruttau: Deut. Zeit. f. Chir., xxv.
20. Davis: Johns Hopkins Bull., February, 1914.
21. Mayo, C. H.: Annals Surg., 1917, lxvi., 568.
* Draper Maury subsequently changed his name to Draper.

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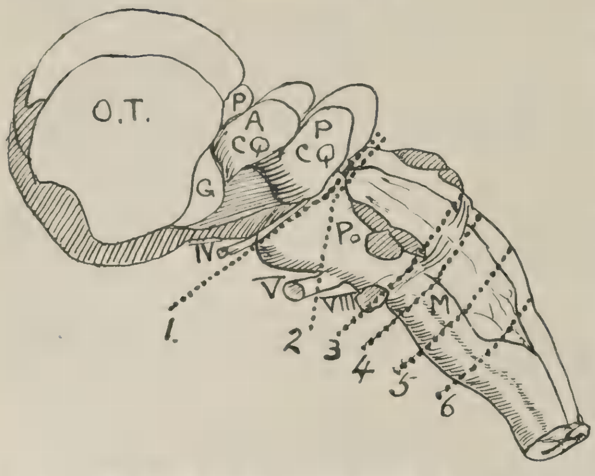
[1] Observations on the Respiratory Centres in the Cat, by Thomas W. Lumsden, M.D. (from the Department of Pathology, Lister Institute). Journal of Physiology, vol. lvii., Nos. 3 and 4.

He states further:—

“*Section in the Upper Part of the Pons.*—A section along line 2, Fig. 1, or at any point between lines 2 and 3, causes instantaneously a full development of the inspiratory type of breathing, and this happens whether the fifth and tenth nerves have been cut or not; a slow deep inspiration is taken, and the inspiratory position is held for two or even three minutes. During the last part of the time the muscles relax slowly, and finally give way suddenly. Two or three relatively quick respirations of abnormal type are then taken. Following these there is again a prolonged inspiration and so on. The cycle repeats itself with great regularity for, it may be, two or three hours, but the duration of the inspirations gradually lessens. The blood-pressure tracing taken simultaneously (Fig. 3 in *Journal* but Fig. 2 here) shows that during prolonged inspiration the arterial pressure first rises and later sinks to a low level. It rises again rapidly during the short period of relatively quick respirations.”

FIG. 1.—*Diagram of Brain-Stem showing Level of Crucial Sections (Cat).*



Level 1, just behind posterior corpora quadrigemina dorsally and above pons ventrally; 2, dorsally same at Level 1, ventrally at mid-pons; 3, just above striæ acousticæ; 4, just below striæ acousticæ; 5, half way between 4 and 6; 6, just above angle of calamus scriptorius. The pneumotoxic centre is placed between 1 and 2. Apneustic centre between 3 and 4. Gasping centre between 5 and 6.

“Section between lines 5 and 6 causes the cessation of all respiratory movement and death.”

Lumsden adds:—

“.... When an animal which has been so nearly dead as to cease breathing is revived by means of artificial respirations, the respiration returns in the reverse order (to the effect of asphyxia or anæsthetics on animal dying from same) a preliminary period of gasping is followed by a series of prolonged inspirations which gradually shorten until they become indistinguishable from slow natural breathing, and soon the normal respiratory rhythm is resumed.”

Morbid Anatomy in the Authors' Case.

It appeared to us that Lumsden's experiments on the brain-stem of the cat were likely to shed light as to the cause of death of this infant. It was most fortunate, therefore, that he was able personally to investigate the brain-stem of this case.

Report by Dr. T. W. LUMSDEN.—“No signs of purpura were visible. On opening the cranium, the vessels on the pia were found to be much dilated and there were a number of subpial punctiform hæmorrhages both on the convexity of the brain and on the walls of the lateral ventricles. The choroid plexuses were intensely injected. The minute hæmorrhages above-mentioned were entirely superficial and there was no escape of blood into the ventricles. There was nothing abnormal to the naked eye in the regions of the pons or medulla. On section of the brain the grey matter was pinker than usual, even in a new-born baby. The brain was carefully opened and placed in formalin for 48 hours, after which it was examined by slicing it and the brain-stem at intervals of about 1 cm., but nothing further abnormal was found.

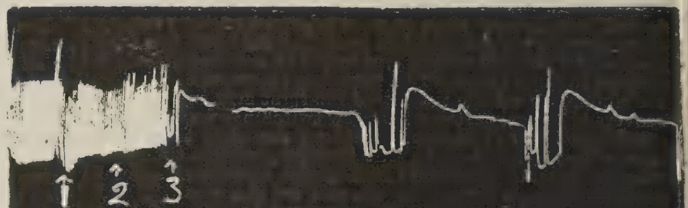
It may be well to state categorically that there was no evidence of meningitis or of gross hæmorrhages into the meninges, the ventricles, or the brain substance. The whole brain-stem and mid-brain, with small portions of the cortex and cerebellum, were preserved for minute examination.

The abdominal and thoracic organs appeared healthy.”

Microscopic Observations.—“But for the universal congestion of all blood-vessels, the portions of the cortex and cerebellum examined and the mid-brain appeared healthy. The brain-stem, stained by Bielschowsky's method and counter-stained with acid fuchsin and methylene-blue, was examined exhaustively in serial section. A few very minute capillary ecchymoses were seen in the upper part of the pons and all the capillaries were much dilated, but except in the area just above the striæ acousticæ serious extravasation had not taken place. Into this region—just above the level of the olivary bodies and constituting the lower 2 mm. of the pons—five or six small hæmorrhages had occurred. The largest of these measured 2 × 1·5 × 1·25 mm. At its lower extremity it surrounded the apex of the right olive, and thence extended for 2 mm. upwards, outwards, and backwards towards the restiform body. This hæmorrhage caused damage to the formatio-reticularis, fillet, a small portion of the seventh nerve nucleus, and some fibres of the trapezium. A second extravasation of almost equal size was found in a nearly symmetrical situation on the left side.

Several other minute hæmorrhages were seen at this level in the formatio reticularis and in the restiform body. If one may apply to man the results obtained in cats[2] the hæmorrhages described above would temporarily, at any rate, have the same effect as section of the brain-stem just above the striæ at level 3, Fig. 1, and would determine the onset of the apneustic type of respiration, which is characterised by alternating periods of inspiratory tonus and gasping (Fig. 2).

FIG. 2.—*Respiration and Blood-Pressure Tracings in a Cat.*



Cut 1 was through the mid-brain; cut 2 at section 1, Fig. 1; cut 3 at section 2, Fig. 1. Inspiration upwards abscissa 12 mm. below time tracing (5 seconds).

In a series of ten cats in which the seventh and eighth nerves were severed intracranially, death, preceded by apneustic respiration and convulsions, resulted. That these results were not directly due to severance of the seventh and eighth nerves but to accidental hæmorrhages into the striæ region from dragging on the nerves, was conclusively proved. It was found that these nerves could be destroyed from the external auditory meatus without affecting the breathing, and if great care is taken not to drag on them the seventh and eighth nerves can, after removal of the cerebellum, be divided intracranially without causing pontine hæmorrhages or respiratory symptoms.

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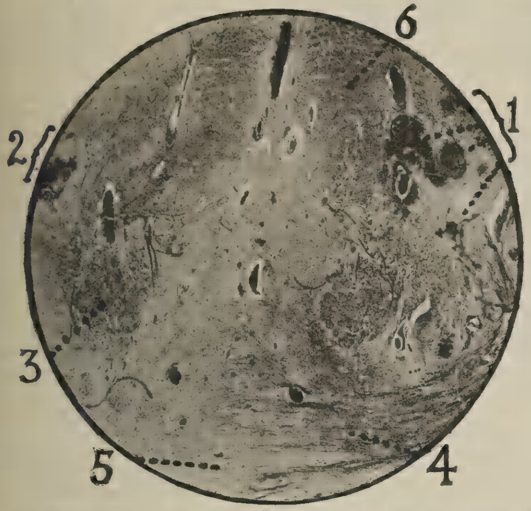
[2] Journal of Physiology, March, 1923.

It is not clear why hæmorrhages occurred in this case, but the feline experiments referred to above indicate that the pontine damage was sufficient to cause death by interference with the respiratory centres situated in the brain-stem above and at this level."

FIG. 3.—*Transverse Section of Brain-Stem just above Striæ Acousticæ.*



1. Largest hæmorrhage. 2. Smaller extravasation on left side. 3. Left pyramid. 4. Transverse fibres of lowest part of pons. 5. Median raphé with many dilated blood-vessels. 6. Right fillet. The unnumbered black spots are distended blood-vessels. Where a white space is seen, blood-clot has fallen out of a vessel or extravasation during section. (Microphotograph × about 10.)

Reference to Other Cases.

It is interesting to note that Still[3] records five cases of a somewhat similar nature. Four were boys; three were in the fourth to the eighth pregnancy. The attack came on without any reason while the infant was lying quietly in its cot. The onset was silent, without distress, and the infant simply ceased to breathe during the apnœic period. The infant had a healthy colour between the attacks, but there was some cyanosis during the attacks. In one of his cases there were four attacks in one day and two the next, and then the attacks ceased and the child recovered. In another there were six or seven attacks in the 24 hours and these continued to recur for seven days before death took place. In Still's cases one out of five recovered. On two of his cases there were necropsies; one showed some collapse of the bases and commencing broncho-pneumonic process, another case showed extensive atelectasis. He was of opinion that these might just as well have resulted from the condition as have caused the attacks. It seemed to him that the condition was more suggestive of some affection of the respiratory centre than of any secondary asphyxia from any insufficient expansion of the lung.

It is not difficult to imagine how over-lying or even foul play might be suspected in a case of this nature under certain circumstances. Looking back on several cases which have occurred in our experience during the last 25 years, we can recollect a few which had symptoms very similar to those described in the case under consideration. It is not unlikely that such cases are a little more frequent than might be supposed.

Cruickshank[4] draws attention to the pressure of the contracting uterine walls on the infant, also to the effects of accidental hæmorrhage, occlusion of umbilical vessels from twisting or prolapse. He states that the heart, continuing to beat, congestion becomes more marked, and that if no relief be obtained the congestion becomes so great that certain of the smaller vessels give way and petechiæ and capillary oozings appear in various situations. All these effects, he states, may be produced by asphyxial congestion alone, quite apart from the additional trauma of labour. He adds: "It is not surprising to find, then, that in a very large number of cases such hæmorrhages do exist." He is of the opinion that asphyxial congestion is the most usual factor in producing hæmorrhage, the pressure of the maternal passages being also very important, while "injuries due to abnormalities of presentation or to operative interference occupy the third, though still one of the important places in the ætiology of these lesions." We quite agree with Cruickshank that probably many infants with quite extensive birth hæmorrhages are born alive and survive, some perhaps to die from broncho-pneumonia and other common childish disorders later on.

Summary.

The important points are: The mother is a healthy primipara, aged 25, who enjoyed excellent health during pregnancy and labour. The labour was comparatively easy and natural. No drugs were given her; a few whiffs of chloroform just before the birth of the child only. There is no similar case in family. Cyanosis was present at birth, but passed off.

There was no asphyxia neonatorum. The infant was well formed, showed no abnormalities, and looked healthy. It took its food well and passed meconium and urine without trouble. There were slight although definite changes noted in the infant within the first 24 hours. These gradually increased in intensity.

Definite attacks of apnœa before the infant was two days old. Heart, lungs, air-passages normal. Twitchings and then convulsions. The infant looked well, and was of good colour, between attacks of apnœa; the cyanosis was only present during attacks. The effect of artificial respiration in cutting short the attacks.

Death within 12 hours of the first appearance of apnœa. The total number of attacks must have been more than a dozen.

Were the convulsions due to the slight changes found on the cortex cerebri or to respiratory failure? The clinical symptoms suggested an affection of the respiratory centre, yet at the necropsy there was comparatively little evidence macroscopically. Indeed, if it had not been for Thomas Lumsden's recent observations in the cat no further investigations would have been proceeded with.

The demonstration by Lumsden of hæmorrhages in the pons which first affected the pneumo-taxic and later the apneustic centres, causing death from respiratory failure. No changes were found in the heart or lungs post mortem. There were no signs of purpura.

The existence of greater frequency of hæmorrhages in the new-born, which was shown by Cruickshank, than has probably generally been entertained and therefore the likelihood that tiny hæmorrhages into the pons are perhaps not so infrequent in new-born infants as most observers believe.

That hæmorrhage into the pons is doubtless an unrecognised cause of death in certain infants.

Taking Still's reported five cases this one makes a fatality of five out of six.

It will be interesting to note if the after-history of cases which recover from this condition show demonstrable changes in the central nervous system.

The necessity of keeping the apnœic attacks in mind in deaths in newly-born infants thought to be due to over-lying or foul play.

The treatment in a definite case would appear to consist of artificial respiration and the use of oxygen during the attacks; keeping the child quiet and seeing that the bowels are kept properly open.

The prophylactic treatment obviously commends itself in the prevention of undue cerebral congestion from too prolonged a labour on the one hand and the avoidance of undue interference on the other. Even most careful steering between Scylla and Charybdis would probably not prevent some cases; possibly there is an innate peculiarity of the blood-vessels in them. Again, we know that some infants who have suffered from fairly bad asphyxia neonatorum show no abnormality later in life. It would be interesting to hear the views of others who have had similar cases.

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[3] G. F. Still: Attacks of Arrested Respiration in the New-Born, THE LANCET, 1923, i., 431.

[4] J. N. Cruickshank: The Hæmorrhages of the New-Born, THE LANCET, 1923, i., 836.

Our thanks are due to Dr. Lumsden for the great help he has given, not only by his observations on cats, but by his investigations in this case.

THE MODE OF TRANSMISSION OF MALARIA:

A HYPOTHESIS ADVANCED BY RICHARD PFEIFFER IN 1892.[1]

BY C. M. WENYON, C.M.G., C.B.E., M.B., B.S., B.SC. LOND.,
DIRECTOR OF RESEARCH IN THE TROPICS TO THE WELLCOME BUREAU OF SCIENTIFIC RESEARCH.

OF the various conjectures on the mode of transmission of malaria which were made prior to the work of Manson and Ross, and the actual demonstration of the mosquito cycle of the parasite of this disease, that of Richard Pfeiffer appears to be the one most logically argued, most accurately deduced, and nearest the truth in the light of subsequent discoveries. Pfeiffer's remarks appear to have been entirely overlooked, probably because they were included in a paper dealing with another subject. The accuracy of Pfeiffer's reasoning is remarkable. It was based on the knowledge gained from a study of the common coccidium of the rabbit, and the scientific mind of Pfeiffer realised the possibility of the parasite of malaria having a similar life-cycle which completed itself, not on the ground in a protective oöcyst, but in the body of some blood-sucking invertebrate which might inoculate the germs thus produced into human beings. The similarity of the reproductive phase of the coccidia in the epithelial cells which they destroyed and that of the malarial parasite in the red blood corpuscles, together with the absence, in the case of the malaria parasites, of any resistant stage which could compare with the oöcysts of coccidia, led Pfeiffer to the view that in some blood-sucking insect lay hidden the secret of the transmission of malaria.

During the years 1889–90 this observer occupied himself with a study of the common coccidium of the rabbit. His paper, illustrated by excellent microphotographs, was published in 1892, and forms a landmark in our knowledge of these parasites. Hitherto it had been assumed that the sporulation of coccidia in the epithelium, and that in the oöcyst after it had left the body, represented two distinct parasites. To Richard Pfeiffer is due the credit of having first demonstrated that these were merely phases of one and the same organism. Sporulation in the epithelium led to multiplication within the host, while that in the oöcyst had to do with the spread of infection to another animal. The resistant oöcyst protected the parasite during its development outside the body. To Pfeiffer the endogenous sporulation of coccidia and malarial parasites were alike, while the absence of an oöcyst in the latter suggested the possibility of the exogenous cycle taking place while protected by some insect's body.

The following is a fairly literal translation of the final paragraph of Pfeiffer's most interesting and important work on the coccidia of the rabbit:—

> As a result of the discoveries of Laveran, Marchiafava, Celli, and Golgi, it is known that in malarial fever the red blood corpuscles harbour characteristic motile amœboid bodies which increase in size, bring about destruction of the occupied cell, and then, at regular intervals, as a result of segmentation associated with the formation of a residual body, produce numerous young individuals, which in their turn always give rise to a new generation of blood parasites. So far all is clear. But how does the parasite gain entrance to the human body? It is possible to produce the fever in healthy men, as was first shown by Gerhardt, by the injection of small quantities of blood from a person suffering from malaria. Without going into this matter further, it is clear that under no condition can this be the normal mode of infection. On the other hand, all epidemiological experience indicates a close connexion between marsh-fever and special conditions of the soil. The first and most evident idea was that in some way the blood parasite concerned was present in the soil or in the water of the infected locality, and that it attacked man [illegible] a result of inhalation or by way of the digestive tract. But all investigations which have been conducted along this line have remained without result. This is no longer surprising since we have learnt that the blood parasitising protozoa are extraordinarily delicate, and are entirely unsuited for a free life in the outer world. Grassi's hypothesis that the widely distributed amœbæ of marsh water enter the blood of man, transform themselves into malarial parasites and, as a result of adaptation to the existing conditions, lose their power of existing as free living organisms, is based on so forced a supposition and receives so little support from experiment, that it does not indicate a way out of the prevailing difficulty. How then is the undoubted dependence of malarial infection on environment to be explained? The following solution suggests itself, but I bring it forward only as a hypothesis, the justification for which rests in the fact that it indicates a line of investigation. It is possible that in the case of the malarial parasite also there exists an exogenous phase, a developmental cycle which completes itself outside the human host, possibly in the body of a lower animal (as, for instance, certain insects) and possibly also, in part at least, in the soil. This exogenous malarial germ could then be conveyed to man through the air or water, or as Robert Koch has remarked to me, through the sting of blood-sucking insects.

The reasoning is so sound, and has been so completely justified by subsequent investigations, not only on the life-history of the malarial parasite itself, but also by the discovery of the close relationship which exists between malarial parasites and coccidia, that it seems worth while to call attention to Pfeiffer's remarks.

Clinical and Laboratory Notes.

THE PROVISION FOR EXPIRATION IN ENDOTRACHEAL INSUFFLATION ANÆSTHESIA.

BY I. W. MAGILL, M.B., B.CH., B.A.O. BELF.,
SENIOR ANÆSTHETIST, QUEEN'S HOSPITAL, SIDCUP; HONORARY ANÆSTHETIST, BROMPTON HOSPITAL FOR CONSUMPTION.

THE value of endotracheal insufflation anæsthesia for operations in the region of the head and neck is too well known to require any comment. In certain cases, however, particularly those in which the method is specially indicated—namely, operations involving the lower jaw and mouth—lack of adequate provision for expiration may, by its effect on the patient, interrupt the course of a smooth anæsthesia or embarrass the work of the surgeon.

(1) With regard to the patient, partial respiratory obstruction due to the falling back of the tongue, pressure on the lower jaw, or other cause, may produce a form of hyperpnœa with laboured expiration, consequent congestion, and increased hæmorrhage at the site of the operation.

(2) With regard to the surgeon, to operate under the full force of the patient's anæsthetic-laden expirations is at least unpleasant. When there is bleeding into the mouth or upper air-passages the additional accompaniment of a spray of blood is unlikely to assist either his temper or his technique.

These effects may be counteracted in many instances by means of a firm-walled rubber tube of sufficient calibre passed into the pharynx through the mouth or nose, according to the site of the operation, and connected to a further short piece of tubing by a metal elbow. Movement of the patient's head by the surgeon, however, or pressure on the lower jaw, may cause obstruction of the pharyngeal end of this tube at any time with some of the undesired effects described above. The satisfactory results obtained by passing an expiratory tube into the trachea alongside the catheter have led me to adopt this procedure where possible in every case in which endotracheal insufflation is the method of choice. Expiration as well as inspiration is brought directly under the control of the anæsthetist, and the pharynx can be as effectively plugged as desired.

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[1] Pfeiffer, R. (1892): Beiträge zur Protozoen-Forschung, I. Heft Die Coccidien-Krankheit der Kaninchen, Berlin.

When the mouth is available for the administration, catheter and expiratory tube can be fastened together and passed in one manœuvre. When the nose is the available channel, the catheter is passed through one nostril and the expiratory tube through the other, each being picked up in the oral pharynx with a forceps for the purpose[1] and passed into the trachea by direct vision. A suction pump is used in conjunction with this method to maintain a clear field when there is bleeding into the mouth or nose.

The course of the anæsthesia when conducted in this way is, in my experience, smoother than when a catheter alone is used, and its advantage to the surgeon is obvious. I understand that double channel catheters are used in some continental clinics, but in this country I have been unable to obtain any of sufficient (double) calibre for the purpose.

Sidcup.

ACUTE KETOSIS DURING PREGNANCY.

BY J. HARGREAVES ROBINSON, L.A.H. DUB., L.M.R.C.P. IREL.

THE following case of acute ketosis of pregnancy is of interest by reason of its sudden and acute onset, and the happy issue under appropriate treatment.

A primipara, aged 32, during the seventh month of pregnancy developed a rapidly increasing anasarca in a few hours. Previous health excellent. Urine: amber colour, reaction acid, sp. gr. 1010. Albumin, trace; sugar, nil. Symptoms quickly increased in severity. There was cough due to œdema of the larynx, aphonia, lethargy, fibrillary tremors, pain and stiffness of the joints, irregular respiration during sleep, almost of the Cheyne-Stokes type, large circumscribed patches of transient erythema, severe stabbing pains in the hepatic region, sour taste, odour of acetone from the breath, spongy gums, sordes, ocular phenomena, which are now subjectively described as "something like the effect produced by opening the eyes under water and seeing for an instant moving shadows." Unilateral œdema of the face after sleeping on the side. Fœtal activity.

I am indebted to Dr. Cronin Lowe for the following report on the urine: Albumin present, but too small a quantity to estimate; reaction acid; acetone present; diacetic acid present; urea, 0·77 per cent.; ammonia, 0·15 per cent.; ammonia coefficient, 1 to 5·1. Centrifuged deposit: Pus cells, a few; blood cells, nil; casts, nil; epithelial cells present.

The clinical condition increased in severity, and Dr. Leith Murray passed bougies into the uterus to induce labour. On removal of the bougies the membranes were ruptured, and six hours later Dr. Philip Vickers delivered with forceps without an anæsthetic. Two sutures (20 day chromic catgut) were inserted into the perineum; they dissolved out on the fifth day, and left a peculiar depressed areola about ¼ in. in diameter at the site of insertion. Sodii bicarb. ¼ lb. was given during the three days preceding delivery. The following were also given: Calcium lactate ½ drm. daily; ol. ricini 2 oz. at the onset of the condition; 12 hours later sodii sulphas ½ oz., and subsequently 1 drm. doses three-hourly; rectal salines. The urine became alkaline four days after delivery. The infant (weight 5 lb. 6 oz.) showed transient patches of erythema during the first week after birth. In consequence of the small capacity of the stomach at birth the infant was fed two-hourly on undiluted cow's milk, with sodii citras 3½ gr., gradually increased to 6 gr. in each feed. Eleven feeds in the 24 hours. Body-weight at 14 weeks, 13 lb.

The mother's recovery was uneventful.

Southport.

BRONZED DIABETES:

ITS REACTION TO DIETETIC AND INSULIN TREATMENT.

BY E. BOSDIN LEECH, M.D. CAMB., F.R.C.P. LOND.,
HONORARY PHYSICIAN, MANCHESTER ROYAL INFIRMARY.

THE origin of bronzed diabetes is still unknown. The case here recorded was not diagnosed till after death, and during life the patient received the modern diabetic treatment as carried on at the Manchester Royal Infirmary. It is of interest to see how he responded to that treatment.

A male, aged 47, was admitted to hospital on May 5th, 1923, with acute diabetes of three months' standing. During life there was no definite skin pigmentation and the skin was sallow or possibly slightly icteric. From May 9th to June 12th he was treated dietetically on the lines of the Allen treatment. May 9th to 11th, preliminary diet; 12th to 15th, fluid (starvation) diet. On this the sugar disappeared. The caloric value of the food was then gradually raised, but sugar appeared on the 18th (with 327 cal.), 22nd (360 cal.) lasting four days; June 4th (952 cal.) and 8th (952 cal.). The blood-sugar results during this time were: May 9th 0·2816 per cent., 29th 0·1968 per cent.; June 10th 0·2816 per cent. About the last-named date the patient developed œdema and ascites, and it was evident that he was not going to improve with simple dietetic treatment. It had not been possible to train him up to take even 952 calories daily. Insulin was therefore given, 15 units daily, 10 at 8.30 A.M. and 5 at 6.30 P.M. A diet was given with cáloric value 2183, later reduced to 1683. With this a trace of sugar persisted. Numerous blood-sugar estimations varied from 0·0625 on the first day of insulin treatment to 0·2062 on June 19th.

The patient never showed any improvement with the insulin, but became weaker, more emaciated, and more water-logged. On June 25th he refused food and the insulin was of necessity discontinued. He died on the 27th.

Medical Societies.

SOCIETY OF MEDICAL OFFICERS OF HEALTH.

MATERNITY AND CHILD WELFARE GROUP.

A MEETING of this group was held on July 3rd at 117, Piccadilly, W., Dr. H. K. WALLER, the retiring President, being in the chair.

In the absence of Prof. E. MELLANBY, Dr. ERIC PRITCHARD opened a discussion on the

Feeding of Infants between the Ages of 1 and 5 Years.

He said that during the last ten years more important discoveries had been made as regards diet than in the previous 10,000 years. The present knowledge was derived chiefly from animal experimentation, since many generations of animals could come under observation, whereas the difficulty of working with humans was that the results of indiscretions were not shown in one generation; in vitamin deficiency, for example, it might take long before any change was noticeable. At the beginning of the study of scientific dietetics energy value of food was alone regarded as important, on the analogy of the needs of a machine. This analogy was true in many respects, but no machine was able to repair, enlarge, modify, or reproduce itself, and if some were made to lubricate themselves they could not, at any rate, clean, stimulate, and protect themselves against external injuries. The human body was required to do all these things and diet had to provide much besides energy value. Milk was an adequate and sufficient food for the human body for the first 12 months of life. The biological value of proteins was now known to differ greatly, and attempts made to classify foods on this basis resulted in a table in which meat stood highest, followed in order by milk, wheat, lentils, beans, and maize, which had a biological protein value only one-third of that of good meat. This might account for the pellagrins in certain parts of America and elsewhere if maize was the staple diet. Besides biological value mineral elements were important; too much attention had recently been centred on vitamins, which were no more essential than iodine or soda. The depletion of alkali reserve, which could be restored by mineral matter in organic combination, was responsible for much ill-health, which a more liberal allowance of fruit would cure. E. V. McCollum in a recent book had given three elements of a safe dietary: (1) Milk; (2) small-leaved green vegetables and fruits, for their salts, bases, and vitamins; and (3) offal, of which the biological protein value was much higher than, for example, that of fish. The real essential was not to concentrate on any one aspect of the subject, but to plan a diet bearing in mind energy value, balance, salts, vitamins, and also digestibility and favourable distribution of meals.

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[1] Magill, I. W.: Brit. Med. Jour., 1920, ii., 670.

Dr. **Waller** raised for discussion a particular point in the dietetics of young children—viz., the place occupied by cow's milk in the rearing of infants at and shortly after the weaning age. He suggested that if a certain prevalent view is correct, then the baby is unique among young mammals in requiring prolonged milk feeding long after its own mother is capable of the task. For delicate children and for those short of proper nourishment milk is an invaluable remedy. But he held that large numbers of working-class parents, who give their children little or no cow's milk after weaning, show that healthy infants can be reared in this manner. He raised the question for two reasons. The first was that he thought the secret of this type of feeding was worth examining in view of its obvious success. The second was that it differed radically from the manner of feeding commonly prescribed by doctors and nurses for children in the nurseries of the well-to-do—often with an equally obvious lack of success. There might well be a danger that, owing to the growing authority of the infant welfare movement, this tendency to prolonged milk feeding of the young might be too rigidly imposed on the class of parents attending infant clinics with certain disadvantages. He feared a repetition of the unfortunate situation which occurred when two-hourly breast-feeding was widely ordered only to be laboriously cancelled when its drawbacks were appreciated. He wished to emphasise that he referred to children in good health at the normal weaning age, not to invalids or those who could not get food. For these latter types the artisan parent's view that milk is an excellent medicine is correct. But he believed we should keep this medicinal aspect in mind and not lose sight of the fact that an alternative, and biologically a more natural, diet can be framed.

Dr. H. **Scurfield**, who was elected President of the group for 1923–24, spoke of the varied opinions of well-known pædiatricians on a diet suitable for young children. One considered bananas indigestible, another objected to raw tomatoes and cucumber for children under 7. Dr. Scurfield's own children had all eaten cucumber before they were 2. In contradiction to Dr. Waller's views, McCollum had tried to show that the physique of races who had lived on dairy produce for thousands of years was better than that of others. McCollum's estimate of the amount of milk that should be consumed daily by an adult was a quart; Mellanby suggested a pint. In connexion with vitamins, Dr. Scurfield referred to Dr. W. Cramer's researches,[1] and said that experiments on feeding poultry confirmed his conclusions as to the beneficial results of a diet especially rich in vitamins. The fact that no variation in the composition of human milk was noticeable in tropical climates rather spoilt the theory that milk was adapted to the child's needs under all circumstances; in this case one would expect the fat content to be lessened in hot climates. Dr. Scurfield drew attention to the high temperatures to which milk was subjected in the process of making Devonshire cream, which might be said to be made from pasteurised milk.

Dr. **Mabel Brodie** drew attention to the fact that in many districts the mothers could not afford to buy cow's milk or dried milk for infants who had been weaned. Many young children could not digest uncooked vegetables, and few were given any meat until between 4 and 5. She asked when normal children should first be given meat.

Dr. **Maitland Radford** said that the assumption that milk was necessary for young children was of great administrative importance, exemplified by Ministry of Health orders. The Ministry paid half the cost of giving away a considerable amount of milk to expectant and nursing mothers and children under 5. If Dr. Waller's theories were correct, they might do much better with the money.

Dr. H. P. **Newsholme** asked how mothers were to be instructed. Of recent years research had increasingly emphasised the value of green vegetables and the use of cereals as a main source of diet was being deprecated. The question was not yet decided, however, whether the older method of feeding was practicable in modern times, or even beneficial nowadays. The increase in consumption of cereals by a town population was dependent on their easy carriage, whereas fresh country produce was difficult to convey. Cereals were not ideal foods, but were useful in energy content and could easily be supplemented by "safety" foods.

Dr. C. L. **Williams** (Todmorden) said that Gowland Hopkins's "Law of the Minimum" had crept into a few text-books, but it was not generally realised how wide were the possible variations in acceptable dietaries. Dogmatism at this stage of our knowledge must be avoided. The essential elements in diet could be bought for a few pence and the rest could be chosen to suit individual taste. For example, there was nothing particularly evil about fish and chips as an article of diet, but when children were given fish and chips only protest must be made.

Dr. **Mary Kidd** contended that milk could not be dispensed with, and attributed our C 3 population to the tardy effects of under or defective feeding of children. The action of the Ministry of Health in providing milk should not be discouraged, though Dr. Waller's views should be borne in mind.

Dr. E. H. T. **Nash** (Isleworth) pointed out the difference in nutritive value and digestibility between bananas and plantains.

Dr. **Stella Churchill** said that since medical men had not interested themselves in the matter of the diet of healthy young children until recent years, much could be learnt by observing the way of tradition. An important point was to give children what they liked to eat. If greens were given early enough children liked them, also meat, chicken, or fish, but they did not as a rule like milk or suet puddings. Tomatoes, cucumbers after the age of 2, and eggs were better than cereals.

Reply.

Dr. **Waller** pointed out that he did not doubt the enormous value of milk for delicate children. In his opinion statistics showed that it was a mistake to keep children on a fluid diet.

Dr. **Pritchard** said that he thoroughly agreed with Dr. Newsholme's remarks. One after another cheap food was being discarded or excluded from dietaries because it contained no vitamins; this was ridiculous since vitamins could easily be supplied separately in concentrated form, as in fruit juice, cod-liver oil, and marmite. Separated milk was an excellent foodstuff properly supplemented. The descrediting of Marylebone cream, in spite of its acknowledged energy value, on the count of absence of vitamins appeared to him pure folly. "Get your cheap vitamins somewhere else, but don't condemn good foods" was Dr. Pritchard's concluding message.

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[1] The Lancet, 1921, ii., 1202; Ibid., 1923, i., 1046.

Reviews and Notices of Books.

ENCYCLOPÆDIA MEDICA.

Second edition. Vol. IX., Mammillaplasty to Obesity. General Editors, Vols. I.–VIII., the late J. W. BALLANTYNE, M.D., C.M., F.R.C.P.E.; Vol. IX., ALEXANDER GOODALL, M.D., F.R.C.P.E. London and Edinburgh: W. Green and Son, Ltd. 1923. Pp. 672. 30*s.*

Dr. J. W. Ballantyne, who edited the first eight volumes of the second edition of the Encyclopædia Medica, died in January last, and this regrettable event has, we are informed, delayed the appearance of this volume. The references in many of the articles are, indeed, not to very recent work, though the spirit of most of them is modern. The publishers announce that they were able to secure the editorial services of Dr. Alexander Goodall, for the completion of this and the remaining volumes of the series, of which the publication is expected to be completed next year. Vol. IX. maintains the standard of previous instalments. Notable among those articles revised by the original authors are those on Forensic Medicine, by Prof. Harvey Littlejohn, on Infections of the Nails, by Dr. George Pernet, on Occupation Neuroses, by Dr. Wilfred Harris, and on Acute Inflammations of the Nose, by Mr. Herbert Tilley. It is natural that auto-revision should give the best result, for the introduction of a revising hand, although essential in certain cases, can hardly fail to alter, though perhaps very slightly, the point of view of the original writer. Specially successful, however, is the revision by Dr. C. B. Ker of the section on Epidemic Cerebro-Spinal Meningitis by the late Sir William Osler, and that by Dr. W. A. Potts on Mental Deficiency, written by Dr. G. E. Shuttleworth. New articles are those on Military Surgery, by Sir D'Arcy Power, Mycetoma, by Major W. S. Patton, I.M.S. (ret.), and Neurasthenia, by Dr. Ivy M'Kenzie. We regret that the list of principal articles in the volume, with the names of authors or revisers, is not supplemented by an index of the authors of short articles on subjects of smaller range though by no means necessarily of less importance. Some of these shorter articles, notably one on Masturbation, appear to be most admirable summaries of the subject dealt with, and since the views expressed are not free from controversy, an indication of the name of the author would give confidence to those who hold the same opinions. This is almost the only omission in an admirable volume.

CLINICAL DIAGNOSIS OF INTERNAL DISEASES.

By LLEWELLYS F. BARKER, M.D., LL.D., Professor of Clinical Medicine, Johns Hopkins University. In three volumes. London and New York. D. Appleton and Co. 1923. Pp. 2908. £5.

THESE three volumes originally formed part of a series of six, entitled Monographic Medicine, published in 1916. In a foreword it is stated that they have been republished separately in response to "requests from various quarters." The first feeling produced on looking through the republished volumes is curiosity as to what could have formed the subject-matter of the remainder; for Prof. Barker takes all medical knowledge for his province, even including in his monograph conditions such as ringworm and chronic mastitis, which hardly seem to merit the designation "internal." In an introduction, written in 1916, the author points out that the present-day physician, or "internist" as he prefers to call him, is, or at any rate should be, engaged in "attempting to visualise clearly the functional pathological processes that are the essence of disease." His aim in writing has been to supply information as to methods and procedures available for following these functional pathological processes. This involves the description of the means employed in the investigation of cases in all the fields of medicine, an undertaking of such vast extent that it is amazing that one man should have been found capable of attempting it. That Prof. Barker did attempt it single-handed was due to his belief that "the problems of selection of matter for such a work as the present are such that they can best be met by one man, provided that he has had large clinical experience, some years of laboratory training, and has always been in close touch with clinical workers." Such a man—we had almost said superman—the author would certainly appear to be, and in 1916 the present work must have been nothing short of prodigious. The whole field of diagnosis was covered, so far as it had then been mapped—roentgenology, bacteriology, hæmatology, biochemistry, and biophysics; with all of them the author displayed an equal and astonishing familiarity, and laid before his readers the fruits of the latest work. But that was in 1916, and now it is 1923, and the volumes have apparently been reprinted without further comment, without withdrawal or addition, and with no reference under seven years' old.

Perusal of the work to-day is, in some respects, encouraging. It serves to convince that in spite of cavillers, medicine, so far at any rate as diagnosis is concerned, does move. Prof. Barker's work was in the very forefront of the advancing tide in 1916; in 1923 that tide has flowed far beyond. No doubt it has carried a good deal of worthless flotsam with it, but it has also borne many things of real value. Among these may be mentioned the newer knowledge of the accessory food factors and their relation to the deficiency diseases; the recognition of the curative powers of the actinic rays of sunlight in rickets; the more recent methods of estimating the sugar in the blood, which have made it possible for even the general practitioner with some biochemical training to distinguish true diabetes from the various glycosurias and to follow the condition of his diabetic patients as never before; the simplified urea tests for the gauging of renal functions; the estimation of thyroid overaction or deficiency by observations on the basal metabolism—and the list might be prolonged a good deal further.

It is justifiable to question the wisdom of Prof. Barker in allowing his book to be reprinted even in response to the urgency of its admirers until he or someone else had brought it up to date. It would be unkind further to insist upon the lapses of omission and inclusion incident upon the production in 1923 of a work completed in 1916, and apart from these nothing but matter for admiration remains in Prof. Barker's book. The descriptions of all the well-established clinical methods are excellent. In his zeal for more modern methods the author has not neglected the older modes of investigation, and his description of physical signs of all types and descriptions are masterly. On the main clinical features of every disease he may wish to investigate the practitioner or student could have no better guide than Llewellys Barker.

MEDICAL DIETETICS.

Vorlesungen über Diätbehandlung innerer Krankheiten. Fourth edition. By Prof. H. STRAUSS, Berlin Jewish Hospital. Berlin: S. Karger. 1922. Pp. 471.

Prof. H. Strauss's volume, which has reached a fourth edition, gives in the form of 17 lectures a thoughtful and thorough exposition of the principles which should guide the physician in prescribing food in the commoner diseases. The dietetic treatment of alimentary disorders naturally takes up a good part of the volume. But circulatory and kidney diseases, gout, diabetes, obesity, infectious diseases, and post-operative diets also receive full attention. The tables of analyses at the end are exhaustive and are cast into a useful form, giving the calories, protein, fat, carbohydrate, and water in 100 g. of each food, both raw and as served at the table. Special mention must be made of the valuable appendix of hints for the dietetic kitchen by Elise Hannemann. This contains nearly 100 pages of good recipes; and of each the composition and the food value are stated. The author rightly asserts that for the dietetic treatment of constipation an exact diagnosis is of first importance. The causes are various; and loss of the power of expulsion is seldom one of them. The delay may be due to atony, to spasm, or to weakness of the abdominal walls, and may be complicated by stenosis, by mucous colitis, or by piles. We notice that the use of X rays to determine the actual nature and seat of the delay is not mentioned. For the spastic forms of constipation a diet calculated to render the motions soft, but poor in cellulose, is advised. It would contain little or no meat, abundance of fruit juices and jellies, honey, whey, buttermilk or sour milk, milk-sugar, lævulose, olive oil, paraffin or agar-agar. For the torpid forms of constipation the usual wholemeal bread, salads, and fruits are recommended. In mucous colitis the cellulose-poor anti-constipation diet is first tried, and later, if needed, a cellulose-rich diet as advocated by v. Noorden.

In speaking of diet in kidney disease Prof. Strauss lays stress on the fact that in many cases of nephritis there is no demonstrable impairment of renal function. There may be a harmless "anephritic" albuminuria. The quantity of albumin is not indeed of value as a guide to the severity of chronic nephritis; neither has diet such a definite influence upon it as was formerly supposed. He doubts also if small quantities of spices and condiments have any adverse effect on the kidney. The reader cannot fail to note Prof. Strauss's practical acquaintance with the phases and consequences of starvation. The copious details offer an arresting contrast to the pre-war literature of a few references to special fasting experiments. We may hope that Europe will see no more of hunger-osteopathy and hunger-œdema. In treating sub-nutrition exercise is valuable. Weak and very thin patients should begin their treatment in bed, but the muscles must be kept in condition by massage, faradisation, and exercises. In the chapter on diabetes the various methods of dieting are discussed in general terms, but few specific instructions, such as the doctor really needs, are given. The analyses of foods are stated in percentages as a rule, though there is one useful table which gives the weights of various foods containing the same quantity of carbohydrate as 10 g. of white bread. A great deal of calculation would be needed to prescribe an accurate diet from these data, much of which can be avoided by the use of tables such as modern English and American text-books on diabetes supply. There is in other chapters also a general tendency to enunciate the principles and to limit the practical application to giving lists of foods to be taken or avoided in the various disorders. The value of these lists would be increased greatly if they were more often supplemented by a detailed account of an actual day's food. The vitamins come in for little attention. Indeed, apart from a discussion of the classical deficiency diseases of scurvy, scurvy-rickets, and beri-beri, the author does not deal with them in detail. He speaks also with caution about the recently expressed view that calcium deficiency is a cause of diseases such as asthma, hay fever, and certain catarrhs.

This is a wise book, a little conservative perhaps, but full of sound experience and knowledge, and free entirely from the dogmatic empiricism which creeps so easily into works on diet.

THE NERVOUS CHILD.

Second edition. By HECTOR CHARLES CAMERON, M.A., M.D., F.R.C.P., Physician in Charge of the Children's Department, Guy's Hospital. Oxford Medical Publications. London: Henry Frowde and Hodder and Stoughton. 1923. Pp. 224. 7*s.* 6*d.*

WE like to think that this little book, now appearing in a well-merited second edition, is a product of the English mind and the English spirit. It lies poles asunder from the dreary nastiness of some more ambitious productions emanating from other sources and ostensibly dealing with the mental life of the nervous child. Through its pages runs an illuminating ray of common-sense and medical wisdom which is no less pleasing than instructive. Our children are largely what we make them. In several passages Dr. Cameron rightly lays the emphasis, not on infantile or juvenile experiences per se, but on the attitude of parents and nurses to these. In showing their own apprehensions, and communicating them, they sap the confidence of the child. He declares in no unmeasured terms that for the treatment of childish neuroses psycho-analysis has dangers and produces ill-effects far outweighing any presumable advantages to be gained from it. Management rather than treatment is the keynote of many of his chapters, prevention rather than cure, nursery hygiene rather than specialists' consulting rooms. It is a book to place without reserve in the hand of intelligent parents, governesses, and nurses, no less than in that of the practitioner of medicine; its general tone of optimism is reassuring and cheering; its outlook is sane and healthful, its quiet humour comforting. The insight shown by Dr. Cameron into the mind of the child reveals the profound student of his subject.

DIE LUMBALPUNKTION.

Anatomie, Physiologie, Technik, Untersuchungsmethoden, diagnostische und therapeutische Verwertung. By Dr. MARTIN PAPPENHEIM, Privatdozent in the University of Vienna. Vienna: Rikola Verlag. 1923. Pp. 184.

IN the course of the last ten years a number of text-books dealing with the cerebro-spinal fluid have appeared, but since the subject is one to which research is constantly being devoted, finality has not been reached; new methods come into vogue, new discoveries are announced, new diagnostic procedures are elaborated, with embarrassing frequency. Dr. Martin Pappenheim's brochure represents the very latest advances in all that concerns the fluid. The work is stronger on the chemical than on the microscopical side; Chapter X., on qualitative cell-examination, might be amplified with advantage, and would in any case be improved by drawings of the cell types enumerated. This little book should be in the hands of every laboratory worker, and the clinician will appreciate its usefulness in spite of its admittedly technical character.

LEHRBUCH DER NERVENKRANKHEITEN.

By H. OPPENHEIM. Seventh edition, revised and enlarged, by R. CASSIRER, K. GOLDSTEIN, M. NONNE, and B. PFEIFER, in collaboration. Berlin: S. Karger. 1923. Vol. I. With 323 illustrations and 4 plates. Pp. 923. 27*s.*

GERMAN neurology suffered a grievous loss by the death of Hermann Oppenheim on May 23rd, 1919. It is no mere figure of speech to say that he left behind him a monument of enduring value in his classical text-book, which now appears in a seventh edition, revised and enlarged by four distinguished German neurological confrères. Dr. Cassirer undertook the responsibility of preparing this latest edition, though he says in his preface that with the passing of Oppenheim no single worker could supervise the whole of the field of neurology without help. Hence the collaboration already noted. Oppenheim's book is a treasure-store of neurological knowledge. Scanning its familiar pages again one does not know whether to admire most its comprehensiveness, the skill with which an overwhelming amount of detail is marshalled for assimilation, or the personal touch which runs like a thread through the whole. A cyclopædia of this kind is of permanent importance; it is the outcome of a love of scientific truth which oversteps all national and racial boundaries. We may hope that generations of neurological students who never knew Oppenheim in the flesh will keep his memory green by their appreciation of the best book on the subject that has ever been written.

THEORIES AND PROBLEMS OF CANCER.

By C. E. WALKER, Associate Professor of Cytology in the University of Liverpool. London: University of Liverpool Press and Hodder and Stoughton. 1923. Pp. 126. 5s.

IN this small book the author has brought up to date a series of articles written for Science Progress in 1912. It is addressed to the intelligent layman as well as the more professional public, but we fear that few of the former will be able to understand it, for Prof. Walker fails to realise the width of the gap in thought and terminology which separates him from his neighbour in tram or bus. For the latter it provides a rather gloomy review of those aspects of the cancer problem which have most interested the author. He writes as one wandering hither and thither in a dark forest, not as a happy and adventurous pilgrim who knows that the golden age is just round the corner. It is surely superfluous sadness to belittle the experimental study of transplantable tumours because it has not revealed the cause and cure of cancer and to neglect the great fundamental advances in our knowledge of its nature which have been achieved by this method by the Imperial Cancer Research Fund and others, and which, as far as can be imagined, could have been made by no other means. And it is a simple assumption to say that work in other directions would have been of far greater value. Plenty of people have worked at cancer in other directions and, to say the least, have found out no more. In detail we may note that the criticism (p. 88) of the view that too hot food and drink may cause cancer neglects the mechanism of swallowing as well as the very striking evidence from China connecting the excess of epitheliomas of the lower end of the œsophagus in males with the habit of the women waiting to eat till the men have finished. The statement (p. 52) that all the symptoms and damage done by malignant tumours are due to pressure or some other mechanical action on the surrounding parts is hardly in accord with clinical experience of cachexia.

The book contains much that is of interest, and though experienced workers may find but little stimulation in its pages, no thoughtful attempt to unravel such a tangled skein as the cancer problem should be disregarded, and we commend Prof. Walker's book to those who are engaged in working at cancer from whatever aspect.

JOURNALS.

BRITISH JOURNAL OF OPHTHALMOLOGY. June, 1923. R. Foster Moore: A Watertight Suture in Trephining. It is generally acknowledged that the localised cystic swelling sometimes seen after trephining is undesirable, and that the result to aim at is a more diffuse subconjunctival œdema, showing that the excess fluid from the globe has free drainage into the subconjunctival space. To obtain this desirable result Foster Moore completes his operation by carefully suturing the edges of his conjunctival incision, thus preventing the sealing down of the lateral parts of the conjunctival flap which takes place if the fluid is allowed from the first to find an exit through an unsutured conjunctival incision.—The late Charles Killick: Treatment of Conical Cornea. Finding the recognised methods of surgical treatment unsatisfactory, Killick has had recourse to a simple extraction of the lens with a subsequent needling operation to form a vertical slit in the capsule. By this means he succeeded in improving the vision of one patient from less than 6/60 to 6/24. As a conical cornea necessarily causes high myopia it is perhaps surprising that this procedure has not been tried before.—R. P. Ratnaker: Blue Cataract. The blue dots sometimes seen in the lens by focal illumination do not interfere with vision very much, and they seldom progress into a condition calling for operation. It therefore seems a pity to use the word cataract. The author suggests that some other word, less alarming to the patient, should be found for all non-progressive opacities of the lens.—C. H. Bryant: The Third Dimension in Monocular Vision. Stereoscopic vision is popularly supposed to be impossible with one eye. Bryant suggests that it is attained by the unconscious comparison of the image which falls in the macula with the more or less blurred images of objects not in the direct line of vision, and this theory seems altogether probable. "An experimental proof of this is readily made by viewing the landscape through a series of opaque tubes of increasing calibre. In proportion as the field viewed is made more extensive and more objects are seen in it, so does the sense of depth become more evident."

JOURNAL OF INDUSTRIAL HYGIENE. May and June, 1923.—In the May issue D. A. Coles contributes a short but useful article on how to report an industrial accident which may result in a compensation claim. First there must be proof that an accident has occurred. Next the present condition, including parts of the body not involved in the accident, should be accurately noted. Then a statement should follow of incapacity caused and prognosis of its temporary or permanent character. If the doctor is immediately on the spot, a plan of the scene of the accident with measurements should be made, and evidence of those present should be taken. Legal proceedings would often be simplified if doctors would remember they may have to become witnesses, which they usually forget while attending to the injured person.—The causation of industrial accidents is dealt with by H. M. Vernon, who, as the result of extensive investigation, concludes that fatigue may cause a moderate increase of accident-frequency when the hours of work are very long; but that during the course of ordinary work-spells fatigue has little to do with any increase of accidents, which is chiefly due to variations in speed of production and the psychical state of the workers. He found accident-frequency at a minimum at 67° F., increasing rapidly at lower and higher temperatures; thus it was 35 per cent. greater at 52° and 23 per cent. greater at 77° than at 67° F.—An important paper by P. Drinker, R. M. Thompson, and S. M. Fitchet, dealing with atmospheric particulate matter begins in May and is completed in the June issue. The authors give an excellent summary of previous work on the subject, although Owens's new jet counter was apparently too recent to be considered. The errors which are involved in various methods used to determine the dust present in air are pointed out. The authors then describe a new apparatus for which high efficiency is claimed. Dusty air is passed through water at 8 to 10 cubic feet per minute; entrainment losses are avoided by spiralling the exhaust air out of the collector and thus changing its direction; a vacuum cleaner motor-fan, which is equipped with a rheostat for speed control, serves as the source of suction; while an orifice meter at the exhaust measures air-flow.—In the June issue H. C. Weston reports an investigation into the efficiency of linen-weavers, which was found to vary directly with wet-bulb temperature; but after 73° F. was reached efficiency fell as the wet-bulb temperature rose. As a working maximum a wet-bulb temperature of 70° F. is suggested to ensure maximum production consistent with health and comfort. Efficiency under artificial light fell below its daylight value by 11 per cent.; to avoid this fall good general as well as local illumination is required. Reasonable reduction in hours of work appear to favour the production of a uniform work-curve without a proportional reduction in total output.—M. C. Sturgis, after inquiring into the effect of dysmenorrhœa among working women, concludes that the great majority of women suffer no appreciable loss of efficiency during the menstrual function; 65 per cent. experienced no handicap, 30·6 per cent. only slight handicap, but 4·4 per cent. were seriously affected. Methods for overcoming any lowered efficiency are put forward.

MENTAL HOSPITALS SERVICE.

Two Scottish Hospitals.

In the annual report for 1922 of the *Glengall Hospital for Mental Diseases, Ayr*, the medical superintendent, Dr. G. Douglas McCrae, protests against the delay which occurs in committing patients to mental hospitals for treatment. Excluding congenital cases, 61 per cent. of the men and 48 per cent. of the women had exhibited symptoms of mental disease for more than a year before being sent to this hospital for treatment—in the case of one woman three years, in another 12 years, and in a third 20 years, had elapsed. Scarcely 9 per cent. of the men and only 16 per cent. of the women were admitted within three months of the onset of the mental illness. With regard to physical health, the proportion of cases seriously exhausted on admission was unusually high at 45 per cent. among the men and 50 per cent. among the women; this index of the hospital nature of the institution ought to appeal to all but the indifferent and unconvincible among the general public. Dr. McCrae regards some of the stereotyped predisposing causes of insanity with a respect which is tempered with some amusement. "Among the causes of the mental illness in those admitted, hereditary predisposition was acknowledged in 30 per cent., as usual. While it may be correct to affirm that no man can become insane unless he be constitutionally 'nervous,' who can truthfully assume, however confidently he may assert, that no case of mental disease has ever occurred among his ancestors? Not even the brain in the Piltdown skull could claim such immunity." "Notwithstanding that the incidence of alcohol is steadily decreasing, a high annual admission-rate is maintained. It is not alcohol that fills the asylums, but it does serve to indicate those who ought to be in the asylum, where the alcoholic degenerate is a *rara avis*, though a well-recognised species amongst the general community." A remarkable item in the statistics is the supply, from the gardens, of 1084¼ lb. of parsley in one year to an institution providing food for not more than 600 people.

The annual report for 1922 of the *Glasgow Royal Asylum* records the acquisition of two new buildings, one of which is being used as a nursing home for incipient cases, and one, which occupies an attractive position overlooking the Firth of Clyde, as a convalescent and holiday home for patients in the hospital. It is also hoped to build a new nurses' home in the near future. An original step has been taken in appointing an instructor in occupational therapy; this is said to be the first example of such an appointment in a hospital of this kind in Scotland. Among the subjects on which research work is in progress are the part played by focal infections in insanity, the blood-sugar content in states of depression associated with anxiety, and the effect of spinal drainage, reinforced by giving mercury and arsenic, in organic disease of the nervous system (exact particulars of this work are not given). The medical superintendent's report embraces a discussion of the part played by alcoholism in the production of insanity. "My general feeling is," writes Dr. D. K. Henderson, "that alcohol as a cause of mental disorder is of great importance, but very frequently also it is merely a symptom, and points the way to a more definite and profound underlying cause. Under these circumstances I think that purely prohibitive measures will never succeed, because the question is not so simple as to be dealt with in such a crude way." The only satisfactory solution, he concludes, is to attempt to produce better conditions of life, and to study the individual and environmental conditions which are at the bottom of this habit disorder.

Two Private Mental Hospitals.

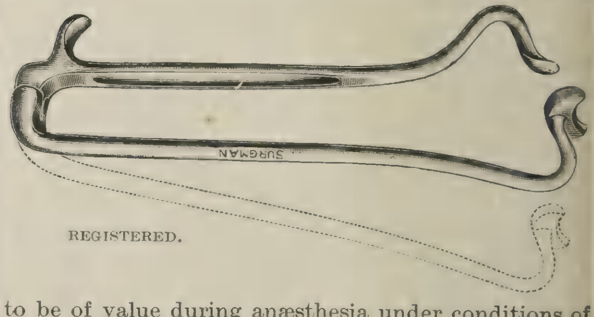
In the annual report of *The Retreat, York*, Dr. Henry Yellowlees, who has succeeded Dr. Bedford Pierce as medical superintendent, maintains a tradition common to several such institutions in contributing a long and very readable superintendent's report, dealing with a number of questions of general interest. Similar points are raised by Dr. Arthur Townsend in the annual report of *Barnwood House, Gloucester*. A remarkable feature of the year's work at The Retreat was the high proportion of voluntary boarders admitted, no less than 46 per cent. of the total number of patients. The proportion at Barnwood House was much smaller, and Dr. Townsend deplores the difficulty of widening the scope of the voluntary status. He cites the example of a voluntary boarder whose condition for the time being became such that, by the present standards, certification was inevitable. Within a fortnight she was well. The problem of providing occupation for the patients is another subject which is engaging the attention of the authorities at both of these hospitals. Games and gardening have always figured largely at The Retreat, and a new social venture is represented in "Harbour Lights," a magazine edited and very largely written by the patients. There is room, however, for more work of a different nature, the whole being systematised under the control of an officer whose time is devoted solely to this purpose. This is the end in view in each case, and Dr. Townsend suggests the possibility of "classes of instruction" in various arts and handicrafts.

At Barnwood House there is some prospect that the nurses may be engaged under stricter form of agreement. In spite of good conditions and relatively high payment, a number have been leaving before their course of instruction has been completed. It is desirable that mental nursing as a career should be brought more generally to the notice of the public; the difficulty experienced in staffing mental hospitals is due chiefly to ignorance, either of the nature of work, or of its mere existence as a career. "It seems strange that while so much is done for the nursing of the sick, so few should be willing to devote themselves to the care of the insane, which is the highest and most difficult of all nursing. . . . To do it well requires high qualities of head and heart; and there can be no better or worthier sphere for those whose desire it is not merely to gain a living, but to be at the same time 'continually doing good.'" This quotation, reproduced by Dr. Yellowlees, is from an annual report for 1875. In his words "it is even more fully true to-day than when it was written almost 50 years ago."

New Inventions.

A MANDIBLE RETRACTOR.

The accompanying illustration shows an instrument devised during the war for pulling the mandible forward under an anæsthetic. This retractor has proved to be of value during anæsthesia under conditions of impeded respiration, and where it is necessary to advance the mandible. In the first instance the instrument was devised for cases in which the mandible had been fractured and originally it was made from iron wire. It has now been in use for some years, and has proved so useful that others may be glad to avail themselves of the pattern made from it by the Surgical Manufacturing Co., Ltd., Mortimer-street, London, W. 1.



London, W. W. Warwick James, F.R.C.S. Eng.

THE LANCET.

LONDON: SATURDAY, JULY 14, 1923.

SMALL-POX AND VACCINATION.

WE printed in the last issue of THE LANCET the official figures giving the notifications of small-pox for the preceding week in England and Wales; those of the following week, bringing the account up to June 30th, have now been published, and are quoted in a statement with regard to the small-pox situation which has been issued from the Ministry of Health and appears on p. 92. This statement dwells in the first instance on the failure at Gloucester to control the disease when control would have been easy. There were cases of small-pox in the city as far back as April, and official warning was received from the Ministry of Health by the sanitary authority early in May that in other cases occurring in distant localities the source of infection had been traced to Gloucester; but notification by local practitioners was refused by the medical officer of health, in the view, presumably, that the diagnosis was in error. The question as to whether the disease was in fact small-pox was finally settled by expert advice, both official and other, when the local authority was immediately assisted, under the superintendence of Dr. W. H. DAVISON, senior assistant to the medical officer of health at Birmingham, to set up a special hospital and special vaccinating stations, to trace contacts, and to do everything possible to stamp out the infection locally, and to prevent its further spread.

The statement from the Ministry of Health, which includes figures proving that the incidence of small-pox is at present widely spread in the country, is uncompromising in its recommendation of vaccination as the only practical remedy now that the infection has been introduced. No one denies that the decline of small-pox, as of most epidemic diseases, is influenced by a rise in the standard of the sanitary conditions and the economic opportunities of the population, but no serious student of epidemiology can doubt that in vaccination we have a practical method of controlling further spread of this disease when an outbreak has occurred. The value of universal compulsory vaccination and revaccination would be well worth discussing in the light of all the information now available and outside the murky atmosphere of dialectics. For the moment it is happily an academic question for the greater part of the country, and even admitting that the influence of vaccination is neither individually infallible nor permanent, this need not impart a hesitating quality into our advocacy of the procedure in face of a local outbreak of disease. The outcome of the frank views of the Ministry of Health is believed in some quarters to be the prelude to amendment in the law, but Mr. NEVILLE CHAMBERLAIN has expressed his belief that no special legislation is necessary.

OPERATIONS FOR DISEASE OF THE GALL-BLADDER.

THE surgery of the biliary tract is passing through the stages which have characterised the evolution of surgery of other abdominal organs. The perfecting of technique by specialist operators has shown the general practitioner how, in case of need, intervention in gall-stone disease may be undertaken with a moderate assurance of an immediate happy outcome. The result is that, rather prematurely perhaps, this branch of surgery is being practised by a large number of men, before knowledge has become sufficiently exact to indicate in all cases the proper course to follow. It is pertinent, too, to remember that the available and reliable statistics are those of the most experienced surgeons who, in their writings, characteristically fail to lay stress upon that perfection of technique which has done so much to furthering their favourable results. For these operators, biliary surgery has passed beyond the stage of developing a technique of intervention to that of deciding what procedure will best meet the existing pathological and physiological processes at work in each particular patient, so that, amongst them, controversy centres round the advisability of cholecystectomy or cholecystostomy, when gall-stones exist without complications. There seems to be a growing conviction amongst operators of experience, not only in this country, that the end-results of cholecystectomy are very much better than those of the simpler cholecystostomy. At a recent meeting of the Royal Society of Medicine, where the surgery of the common bile-duct was under discussion, Mr. JAMES SHERREN emphatically declared that "when the correct treatment for disease of the gall-bladder is carried out," meaning cholecystectomy, "we shall cease to have to discuss and carry out operations for the removal of duct calculi." In other words, his experience has led him to the conclusion that the recognition of early cholecystitis should be followed by removal of the gall-bladder.

Cholecystectomy is, indeed, being very widely practised just now. It must be accepted as a fact that a large percentage of favourable results ensue when they are vouched for by the leaders of gall-bladder surgery, but it is relevant to ask whether we have not travelled too far in this direction; whether, with a more careful selection, certain gall-bladders which are now sacrificed might not be preserved to play their part in the physiological economy of the individual. The fact that patients from whom the gall-bladder has been removed show few signs of being different from normal people, demonstrates no more than the marvellous powers of adaptation the body possesses, for there is abundant evidence that the organ has very important functions to perform. After the gall-bladder has been removed, either there is a varying but constant flow of bile into the duodenum, or, should the sphincter of Oddi remain continent, a dilatation of the bile-ducts behind it, in order to accommodate the dilute bile which is no longer reduced to one-tenth of its volume by gall-bladder activity. In either case the physiology of digestion is disturbed. Achylia occurs in 47 per cent. of cases of gall-stones.[1] In dogs cholecystectomy gives rise to achylia. It has also been found associated with a stone impacted in the cystic duct, which suggests that it is due to loss of gall-bladder function. Some observers, on the other hand, have demonstrated that in man the gastric juice may show normal acidity after removal of the gall-bladder. How can these results be explained? Very possibly they depend upon the behaviour of the sphincter of Oddi, which cannot be predicted. If it remains functional, so that the flow of bile into the intestine is intermittent, then gastric secretion may take place as usual, but should a continuous flow of bile occur, then secretion of the pancreatic and gastric juices is much diminished. The digestive disturbances after cholecystectomy, which are familiar to surgeons of experience and recognised as occurring in a certain proportion of cases, are probably due much more to these causes than to the adhesions which are blamed, but are often not found on re-exploration. If the sphincter of Oddi remains continent after cholecystectomy, the greatly increased pressure against which the liver has to secrete leads to dilatation of the common and intrahepatic ducts, and must surely be disadvantageous to this organ in the long run, just as the kidneys cannot indefinitely secrete against pressure without harm coming to them. When it is remembered that the liver is the largest gland in the body, that it is the great metabolic laboratory of the organism, this consideration cannot lightly be set aside.

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[1] Rydgaarde: Arch. f. Klin. Chir., 1921, cxv., No. 3.

A powerful argument in favour of cholecystectomy is the view that the gall-bladder is the place of origin of the majority of gall-stones. Doubt has been thrown upon this belief by Aufrecht,[2] who states that in atrophic cirrhosis, in the neighbourhood of carcinomatous nodules, and when damming back of bile has occurred during pregnancy, liver-sand is often found in the smaller bile-ducts. The relief of pressure at parturition allows a free flow of bile again, and the discharge of the sand down the ducts is the cause of the biliary colic seen after child-birth. This observer believes that gall-stones arise in the liver and grow in the gall-bladder, so that the removal of the gall-bladder does not necessarily mean the extinction of the focus of origin of gall-stones. E. A. Graham[3] established the constant association of hepatitis with cholecystitis, and the work of M. G. Peterman[4] has demonstrated what the connexion is. He found that if streptococci were injected into the portal vein they could be detected in the wall of the gall-bladder and in the substance of the liver, although the cystic duct and artery had been previously ligated, and that they only appeared in the gall-bladder wall subsequently to their appearance in the liver. Infection took place by connecting lymphatics. It is true also that in early cholecystitis the outer layers of the wall of the gall-bladder are more affected than the mucosa. It therefore seems to follow that the origin of cholecystitis is really in the liver substance. This does not mean that cholecystectomy is a fundamentally wrong operation. It may quite well be that infection in the liver tends towards cure of itself, whilst restitution of the gall-bladder walls to normal is difficult of achievement.

In the light of such recent work, the after-history of patients who have been submitted to cholecystectomy requires careful reinvestigation, with a view to making a true comparison with patients submitted to cholecystostomy, where the gall-bladder appeared at operation to be capable of recovery. Although the mortality of cholecystectomy has been much reduced by modern methods, it remains a more serious operation than cholecystostomy, so that an attempt to restrict its field of application is desirable. To remove a gall-bladder is a confession of failure to attain the ideals of surgery in this region of the body—namely, a restoration to normal function, although it seems from present available evidence to be unusually effective in bringing relief to a large proportion of sufferers.

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THE PRACTITIONER'S RIGHT OF APPEAL.

Last month we received from the Welsh Board of Health a formal notice that after an inquiry, held in accordance with Part VI. of the Medical Benefit Consolidated Regulations for 1923, the name of a qualified and registered practitioner had been removed from the medical list for the county of Glamorgan. Similar notices reach us from time to time from the Ministry of Health. Four years ago, at one of the annual conferences of local medical and panel committees a resolution was passed to the effect that no medical practitioner should be deprived of the right to continue in insurance practice without the liberty of appeal to an independent judicial administrative body or court other than H.M. Insurance Commissioners or the Ministry of Health. Dr. J. H. Clements, who recalls this resolution in our correspondence columns, regards the negotiating body as having been lax in allowing the new agreement for service to go through without establishing this principle of the right of appeal or, as he himself would perhaps more vigorously put it—though this issue is a secondary one for our present purpose—as having claimed the victory whereas they had sold the pass.

The complete facts are not very easy to come by, but the position apparently is, that there is no appeal to the law courts for a practitioner whose name is being taken off the list as a result of such an inquiry as we have alluded to, although under Section 7 of the Nurses Registration Act of 1919 a nurse threatened with having her name removed from the Nursing Register may appeal to the High Court; under Section 9 of the Dentists Act of 1921 a dentist has a similar right of appeal, and under Section 4 of the Midwives Act of 1902 a midwife also has the corresponding right. Why the same facility of appeal was not laid down in the National Health Insurance Acts is not quite clear, although obviously removal from the panel is not so serious a disability as removal from the Register, to which appeal refers in the case of nurses, dentists, and midwives. The Medical Benefit Consolidated Regulations of 1923 make it clear that the panel practitioner has no right to have a special case stated on questions of law arising out of inquiries under Part VI. Part V. of these Regulations, which contains the provisions relating to disputes, appeals, and so forth, does indeed apply (Art. 35) certain scheduled sections of the Arbitration Act, 1889, to "any appeal made to the Minister under these Regulations against a decision of a Committee," and Section 19 of the Regulations runs: "The Minister may at any stage of the proceedings on an appeal, and shall, if so directed by the Court or Judge, state in the form of a special case for the opinion of the Court any question of law arising in the course of the appeal." But this Section 19 was omitted from the 1920 Regulations and is still omitted in 1923, just as in 1920, with the result that there is no right of appeal for a practitioner whose continuance on the list has been made the subject of an inquiry under Part VI. The omission does not trouble the great majority of practitioners who would prefer to go before a tribunal of three, two of whom are doctors, than to go before any other tribunal, judicial or otherwise. In any case Section 19 of the Arbitration Act contemplates appeal only on questions of law, not on questions of fact, and it is estions of fact which matter to the practitioner in inquiry under Part VI. No doubt when the pro-dure of an inquiry under the National Health surance Acts was being assimilated to the procedure arbitration under the 1887 Act, the object constantly fore the minds of those who were devising procedure is that of getting decisions of fact without going to urt. Neither Parliament nor the judicial bench are ely to encourage the re-trial of matters of fact ready decided by some other tribunal. It is one thing keep a lay tribunal straight on points of law, it quite another thing to interfere with it on points fact.

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[2] Deutsch. Archiv f. Klin. Med., 1919, cxxviii., 242.
[3] Surg., Gyn., and Obstet., 1918, xxvi., 521.
[4] Surg., Gyn., and Obstet., 1923, xxvi., 522.

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REWARD FOR MEDICAL DISCOVERY.

THE propriety of monetary recompense for scientific scoveries has been talked and written about for ars without any clear outcome. The real issue is e difficulty of reconciling the two aspects, economical d ethical, of the problem. These two considera-ons are often in sharp and unexpected conflict, hile both must be taken into account. Accepting e position outlined in a recent discussion on rof. DREYER'S work, that even the most startling scovery in modern medicine can be no more an a link in a chain already forged, the element chance in any individual piece of work proving be that link is very large. When fame alone to be the reward, merit is difficult enough to sess; if it be known that fortune also is at stake, eartburnings, struggles, and even those personal tuperations which have, to the honour of medicine, eclined so greatly of recent years, may reappear. ven if the general principle is conceded that on hical grounds that which proves of public service ould be rewarded, the solution of the problem is ot complete. Should the reward be a free gift, or ould it be that form of gratitude which has an eye n favours still to come? We announced last week at the Canadian Parliament had unanimously oted an annuity of $7500 (£1500) to Dr. BANTING, he discoverer of insulin, to enable him to carry on is scientific work—or, as one lay paper phrased it, to devote his life to medical research." It is the terpretation to be placed on this intriguing phrase, uite independent of its immediate context or of the ersonal problems of the present most worthy recipient, hat we propose to investigate.

It is difficult to believe that this example of the anadian Government will not be followed, and it herefore appears important to arrive at definite rinciples which govern such rewards, for they mark distinct stage in the stimulation and encouragement f medical research. It should be settled first of all vhether such grants are to be additional to any salary vhich the recipient would enjoy in the ordinary ourse of events. If not, they really represent nstitutional or university subsidies, and the way ecomes open for intrigues among corporate bodies, vith possible injustice to individuals; if, on the other and, they are additional, then steps must be taken to nsure against the possible economic injustices inherent n subsidised labour. Again, are the grants to be given or actual or potential achievements? If for actual chievements, as already indicated great difficulties vould seem to emerge. The placing of the coping-tone may be the least difficult part of the erection of building, and how shall adjudication be made mong the many labourers who have contributed to he whole? It must be remembered that the greatest liscoveries may fail to receive contemporary recogni-ion. Second-rate work is always more easily recognised by the majority, who themselves are and must be second-rate, and scarcely capable of recognising and immediately appreciating the enduring first-rate. Thus either injustice may be done or a reward may be delayed till it is no longer of use. If, on the other hand, grants are given for potential achievements, what provision will be made to ensure that the worker has facilities for carrying out his work? The ablest men are not always the most congenial colleagues, and we can conceive of a situation arising in which the recipient of such a reward may find it difficult to secure facilities. It must be remembered, also, that while few men achieve one great thing in life, far fewer achieve more than one. Is the recipient to have perfect freedom to elaborate for the rest of his life the details of his discovery—supposing that the same individual is temperamentally capable of such different forms of labour, or must he be for ever striving to produce a second discovery—a dangerous practice, for this way lie prematurity and disillusionment. May he forsake, for example, laboratory work and take up clinical practice, or is he to be tied to the one or the other? To the best type of man more than purely nominal control must be undignified and degrading, yet will nations or public bodies be prepared to support a worker indefinitely, without the periodical report or blue-book? Are they prepared to recognise that having chosen their man they must for ever after trust him and hold their peace, when the first flush of enthusiasm over his initial discovery has faded? The inevitable conclusion is that they must, if the tribute is not to be a yoke rather than a wreath.

To return to the particular instance which inspired this consideration of the broad issues involved, we may regard the rider appended by the Canadian Government to their gift as no more than a graceful recognition of the manner in which the man they have honoured will choose to live his life. This is in substantial accordance with the views of the joint committee representing the British Medical Association and the British Science Guild, whose report on the need for rewards for medical discovery was published in THE LANCET of Jan. 10th, 1920. Their proposals were: (1) That Parliament should resuscitate the precedent of JENNER by paying *compensation* when due for losses incurred in achieving medical discoveries; (2) that Parliament should provide an annual sum, say of not less than £20,000, for life pensions to be given as rewards to such of His Majesty's subjects as have made worthy medical discoveries, such pensions amounting to between £500 and £1000 a year. The Committee add that such pensions would be preferable to donations in capital, and the sums suggested would be sufficient, because men of science seek only such independence as will enable them to employ their talents in the manner they think best. The difficulties which we have set out above were appreciated by Earl BALFOUR, who as Lord President of the Council, received a deputation from the Medical Committee of the House of Commons in support of these recommendations. He received the proposals sympathetically, but held that a better plan would be to place investigators in a more comfortable position for carrying out their research work.[1] The two schemes are not incompatible, and indeed every important discovery made has a secondary value in enhancing the prestige and the claims for a living wage of those engaged in disentangling the intricate problems of medical science.

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[1] THE LANCET, 1920, i., 570.

INDEX TO "THE LANCET," VOL. I., 1923.

THE Index and Title-page to Vol. I., 1923, which was completed with the issue of June 30th, will shortly be published. A copy will be sent gratis to subscribers on receipt of a post-card addressed to the Manager of THE LANCET, 1, Bedford-street, Strand, W.C. 2.

Annotations.

"Ne quid nimis."

THE CENTENARY OF THE LANCET.

THE dinner in celebration of the completion of the hundredth year of THE LANCET will be held in London on Wednesday, Nov. 28th, 1923. Sir Donald MacAlister, President of the General Medical Council, will take the chair, supported by the President of the Royal Society, the President of the Royal College of Physicians of London, the President of the Royal College of Surgeons of England, the Chief Medical Officer of the Ministry of Health, the President of the Royal Society of Medicine, and the President of the Medical Society of London. Dr. J. H. W. Laing and Mr. H. D. Gillies (7, Portland-place, London, W.) are acting as Honorary Secretaries to the Dinner Committee.

THE INFECTING AGENT OF EXANTHEMATIC TYPHUS.

Prof. W. Barykin and Dr. N. Kritsch, of Moscow, have announced[1] the discovery of what they claim to be "with very great probability" the cause of exanthematic typhus. Prof. Barykin has for four years been investigating typhus. He early found that the typhus process so altered the blood-vessels as to facilitate infection of the blood-stream with myriad micro-organisms, all of whom the blood of typhus cases agglutinated. It was in consequence of these very various infections that complications were so frequent, occurring as they do in 30 or even 60 per cent. of the cases. Secondary infections being so frequent, he concluded the true cause could only be discovered in the body in the early days of the disease, in the pre-eruptive stage, and that he could hope for no help from agglutination reactions. So he investigated 23 cases of pre-eruption typhus, finding nothing then in the blood but some small elements (0·4–1·5μ), closely resembling *Rickettsia prowazeki* (0·64μ) or young forms of Plotz's bacillus (0·9–1·9μ); to these he gave the name *Microbion typhi exanthematici*. He and Afanassieff proceeded then to seek for it in 150 cases of human typhus, in 200 typhus-inoculated guinea-pigs, and in specimens from 11 early post-mortem examinations. They found that in the early days of the stage of invasion the bacterium (there seems no occasion for the term microbion) is so constantly present in the blood of the guinea-pig that, by its presence or absence, diagnosis can be definitely made even in the pre-eruptive stage, but the search may last for hours, and many films may have to be examined. It was in the blood that the bacterium was first found, but it occurs in far greater numbers in the cells of the brain, the spleen, and the suprarenals, growing within the cells into clusters, and in time killing the cells. The bacterium is not discoverable during the stage of incubation, and it could not be found in the organs of a hundred uninfected guinea-pigs and men. The investigation next concerned itself with lice; the bacterium was found in the intestinal epithelium and intestinal contents of 1050 of 1500 infected lice; it could not be found in lice from uninfected men. Further, in the intestinal contents of 280 infected lice, the bacterium was found in 192; it was found in the epithelium in 14 of the infected, in only one of the controls. It was difficult to make cultures of the bacterium until Kritsch hit upon the idea of making a medium out of the tissues in which the "microbion" is, customarily, most plentifully found. A pancreatised sterile broth being prepared, small portions of brain or spleen were rapidly removed under aseptic precautions, at early post-mortems of men or guinea-pigs dead in the first stage of the disease; these portions were minced very finely, mixed with the broth, and tubed. The tubes were over-layered with paraffin and incubated at 37° C. During the first ten days, the bacteria which had at first appeared, had gradually died out, and then the "microbion" might appear; it begins to grow in the tissue cells, only later spreading to the fluid. It begins as clusters of Gram-negative cocci, very small; later they increase in size and begin to stain with Gram. It is non-motile. At 37° C. they remain alive for 4–6 weeks, but die in an hour at 50° C.; once established it can be grown on pancreatised spleen- or brain-broth agar, on which it grows, aerobically, in round, glistening colonies. The growth is difficult to emulsify in normal saline; it will not grow in broth. Lastly, of 22 guinea-pigs inoculated with these cultures, 14 became infected; their disease, clinically, closely resembled typhus; few of them died, but in the ten that were killed at the close of the pyrexial stage there were found—hyperæmia of the spleen follicles with hyperplasia, hyperæmia of the suprarenals, hyperæmia and œdema of the brain; in other words, the histo-pathology of the infection produced by the bacterium in the guinea-pig is identical with that originated by typhus in man. On the strength of these observations Prof. Barykin and Dr. Kritsch make the claim that the bacterium is "very probably" the cause of typhus fever. We call attention to their interesting and suggestive observations. In spite of all the work which has been done upon it, the *Rickettsia* is not yet firmly habilitated as the cause of typhus. That the blood in typhus patients is invaded by other organisms needs confirmation. But the Russian authors have found a ready means of cultivating the infecting agent which will pave the way for further investigation.

ACID-FASTNESS.

ALTHOUGH acid-fastness has always been associated with the fatty constituents of the bacillus, this property cannot be removed from the organism by extraction with fat solvents alone. This fact may be considered well established, as Dr. J. A. Shaw-Mackenzie reminds us in his letter in another part of this issue. Aronson[1] it was who showed that if the organisms are treated with an acid in addition to fat solvents the acid-fastness can be completely removed by prolonged extraction. This important piece of work was confirmed by many workers, including Bulloch and Macleod,[2] Much and Deycke,[3] and others. The latter observers also showed that any organic acid such as lactic would answer the purpose. Prof. Dreyer finds that he can remove the acid-fastness by the action of formalin and fat solvent extraction. No explanation is advanced for the action of formalin in place of the usual acid treatment, but it seems probable that it may act by virtue of the appreciable amount of formic acid always present in 40 per cent. formalin. If this is the case the action would be analogous to the reaction of Much and Deycke with lactic acid. The bacilli obtained by this combined formalin and fat extraction treatment are made into an antigen apparently possessing valuable therapeutic properties. Since the discovery and preparation of tuberculin by Koch a large amount of literature has collected on the methods of preparation of tubercular antigens. By varying the technique each worker has hoped to produce an antigen more sensitive for both diagnostic and therapeutic purposes. Gabrilowitsch[4] was probably the first to work on fractional antigens. In 1891 he described a "tuberculum purum," obtained by extracting bacilli with xylol, ether, chloroform, and alcohol. This preparation was used for therapeutic purposes. Armand-Delille,[5] in 1902, worked with ether- and chloroform-extracted bacilli, whilst Leber and Steinharter,[6] in 1908, used an antigen prepared from chloroform-extracted bacilli on 350 patients.

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[1] Archiv für Schiffs- und Tropen-Hygiene, 1923, Nr. 2.

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[1] Aronson: Berlin. klin. Woch., 1898, xxxv., 484; also 1910, xlvii., 1617.

[2] Bulloch and Macleod: Jour. Hyg., 1904, iv., 1.

[3] Much: Beitr. klin. Tuberk., 1911, xx., 345; also 1911, xx., 353.

[4] Gabrilowitsch: Wien. med. Woch., 1891, No. 4.

[5] Armand-Delille: Arch. Exp. Path., 1902.

[6] Leber and Steinharter: Munch. med. Woch., 1908, No. 25.

complete account of fractional antigens is given in series of articles by Much and Leschke.[7] These orkers divide their antigens into three groups. Tuberkelbazilleneiweiss, named Tb. A. The bacilli ere defatted by prolonged extraction with benzoyl loride. There was no preliminary acid treatment, is being hardly necessary when it is remembered that fair quantity of hydrochloric acid would be set free uring the extraction process. 2. Fettsäuren und oide tuberkelbazillen, containing the lipoid and fat ntent. 3. Tuberculonastin, an alcohol and ether tract of the above. Tested as antigens by the mplement-fixation test on various known sera, it was und that where Koch's B.E. gave positive results in ·1 per cent. tuberculonastin gave only 56·2 per cent. of sitives, the fatty-acid antigen 14·3 per cent., whilst e defatted antigen gave only 7·1 per cent. of positives. hese three antigens were used by Much and Leschke r therapeutic purposes, although they refrain from ating how the results compare with Koch's antigens. his book, "Die Immunitätswissenschaft," Much[8] uotes his work with Deycke on defatted and other tigens at great length. It is curious that here again o statement is made as to the relative values of these arious antigens as compared with Koch's preparations. udging from complement fixation. defatted antigen ppears inferior to ordinary B.E. Prof. Dreyer is orking with an antigen defatted in a very similar anner to the Tb. A. of Much and Deycke, and it is the clinical and experimental results that interest ill centre.

SUPERFICIAL SENSIBILITY.

It is more than probable that the skin and touch ave been associated in the mind of man from the time hen he first analysed his feelings. The ancient philo- ophers dealt with the special senses according to heir particular theories, and among these Democritus ay be mentioned as upholding the opinion that all he senses were but modifications of that of touch. ristotle held quite opposite views, and to him the kin was a necessary adjunct to the organ of touch, or certain philosophical reasons, but was not that rgan itself, in the sense in which the eye and ear ight be termed the special organs of sight and hearing. alen subsequently made the distinction more definite, that he seemed to lay more stress on the covering han on the tactile functions of the skin. It was, owever, described later by Constantinus as the organ f touch, tactile sensibility varying in different places. fter this we find Casserius, in the seventeenth century, oing back to the opinion of Democritus concerning he essential unity of the senses, but he referred differen- iation between them to the "sensitive faculty" in he brain: among the ancients this faculty lay in the roper organs of the senses, quite apart from the brain. alpighi now described tactile papillæ in the skin, nd referred tactile impressions to these, considering hem to be formed by ends of nerves. Molinetti shared ith Democritus and Casserius the view that all sensa- ions are modifications of touch-sense, but with him he differentiation had to do with variation in number nd arrangement of nerves, an opinion supported by uffon in more recent times with much ingenuity. hus there has been a slow progress in clarification f view about touch, a correction of opinion about unctions of sense-organs, increasing appreciation of he rôle of the nervous system, search for anatomical ases for opinions, and analysis of the senses them- elves. To-day we find the progress still going on, and he analysis becoming more critical. Head, by his esearches and by the classical experiment on his own rm, led us some years ago to distinguish between eep and superficial sensibility, and gave reasons for ubdividing this last into two classes. Prof. J. S. B. Stopford, who has done much sound and philosophical work in the last few years on wounded nerves, has proposed recently that deep sensibility should also be divided into classes corresponding with those of cutaneous sense. Prof. Stopford has added much to our knowledge of nerve distribution in the upper limb, and has described fibres to the deeper layers from nerves usually considered purely sensory, thus giving a structural basis for certain of his conclusions. He suggests[1] thalamic and cortical terminations for tracts subserving protopathic and epicritic sensation respectively. Evidently anatomico-physiological analysis of touch-sense is progressing satisfactorily but the end of it is not yet.

THE NEW B.P. CODEX.

A NEW and revised edition of the British Pharmaceutical Codex has just been issued by the Pharmaceutical Press (72, Great Russell-street, London, W.C.), by direction of the Council of the Pharmaceutical Society of Great Britain. This is the third edition since 1907 when the Codex first appeared. The scope of it was then defined as an imperial dispensatory for the use of medical practitioners and pharmacists, containing information respecting all drugs and medicines in common use throughout the British Empire, including the principal substances and preparations which are official in the pharmacopœias of France, Germany, and the United States, as well as those described in the British Pharmacopœia. The original work contained in the volume represents the fruits of arduous labour and extensive investigations, partly performed in the research laboratory of the Pharmaceutical Society. but a large proportion privately undertaken by individual members of that Society. The present edition contains much new matter and has been brought into line with the British Pharmacopœia of 1914 and the ninth revision of the U.S. Pharmacopœia. While the general plan of the work has been left unaltered, the chemical nomenclature has been brought into line with modern views and the physiological action of important substances has been extended in accordance with the latest development of medical research. Doses are now set out in metric units with a parenthetic alternative in grains and minims. The extent of time-saving to which a general adoption of the metric system would give rise is apparent in a table giving the percentage equivalents of grains (minims) in pint, pound, and ounce. The index is a marvel of completeness and the Codex, 1923, forms a work of reference of great value and accuracy.

FURTHER DISCUSSIONS ON THE DIET OF THE WEANLING.

NOT much more than two years ago the Society of Medical Officers of Welfare Centres, now incorporated as a group of the Society of Medical Officers of Health, discussed at some length the choice of a diet for a child from weaning to the age of 5 years. The meeting was fully reported in our columns and our comments thereon led to some lively correspondence. It appeared that the subject was to be further developed, for among the items in the programme issued of the proposed activities of the Conference on Infant Welfare held during Baby Week at 117, Piccadilly, London, W. 1, was a discussion by this group on the Feeding of Children from 5 Years of Age, to be opened by Prof. E. Mellanby. This would appear to us a subject of interest to practitioners as well as to parents and to the elementary schools providing dinners to infant classes, though presumably designed for the information of medical officers of infant welfare centres, giving parting instructions on dismissing the child to parental care. Owing partly to an apparent misprint in the programme and to some extent to the absence of Prof. Mellanby, the debate was less illuminating than might have been expected. It dealt with the feeding of children, not after 5 years old, but from 1 to 5, and it will be seen by our report

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[7] Much and Leschke: Beitr. klin. Tuberk., 1911, xx., 341, 351, 405.

[8] Much: Die Immunitätswissenschaft, 1911, pp. 230–261.

[1] Brain, iii. and iv., 1922. Also Jour. Anat., 1918, 1921, 1923.

(see p. 69) that the principal speakers and the points raised did not greatly differ from those at the 1921 discussion. Dr. Eric Pritchard opened with an exposition of his well-known views, which are too sane and broad to stimulate active opposition. Dr. Harold Waller has not found reason to modify his attitude of scepticism on milk as the ideal diet for the healthy weanling. The discussion yielded questions rather than information; Dr. Pritchard resisted firmly attempts made to force him to make oracular pronouncements, intimating that neither he nor anyone else is yet in a position to dogmatise on the ideal diet for children—or indeed for adults. The difficulty is not one of simple progression towards a known goal, but concerns rather the solution of the problem of finding without mathematical instruments the centre of a scalene triangle whose dreaded angles are malnutrition, constipation, and dental caries. It may be easy to find a point equidistant from any two of these acknowledged evils, only to find ourselves perilously near the third. Diets with little indigestible matter are not likely to give stimulation to the bowels of children of costive habit, and bulky carbohydrate foods, though condemned by the dentist and by the dietician, are often prescribed by the physician. Again, the hard food requiring mastication which is desirable to keep even milk teeth in good condition and promote the cleansing flow of saliva may well be beyond the digestive powers of the gastric juice of a very young child, whereas lump or barley sugar, cheap, digestible, of excellent energy value, soluble, and consumed with avidity by children, is hardly ever prescribed even for the marasmic child, possibly out of undue consideration for the teeth. A compromise must be arrived at, and no progress will be made until it is recognised that the contradictory advice so bewildering to mothers is the result of a real conflict between the aims of individual specialists who consider as of primary importance the general nutrition, the conservation of the teeth, or the maintenance of regular defæcation without aperients.

AN INDICTMENT OF PROTEIN TREATMENT.

THE idea that stimulation and irritation of the tissues can be exploited for the benefit of the patient is far from new, and Virchow's teachings in this connexion date many decades back. But it is only of late that protein activation in one or other of its aliases has become a popular vogue, and in Germany, at any rate, the practice of giving remedies by parenteral injection for almost every complaint has become very common. If this treatment is as effective as the list of substances for parenteral injection is long, there would surely be no scope for any other form of treatment. The favourites in this list would seem to be sterilised milk or a 5 per cent. solution of casein, a suspension of sulphur in olive oil, collargol, phylacogen, jodormone (a compound of iodine with horse serum), sanarthrit (a cartilaginous extract), yatren-casein, vaccineurin, ophthalmosan, and other milk products. There are many other proprietary remedies in the same class, and most, or all of them, are supposed to be beneficial on account of focal and general reactions. A feature of this form of medication, which is very impressive from the patient's point of view, is the fact that the physician's prophecy that a febrile reaction will occur in so many hours actually comes true. There is nothing which impresses the patient and gives him faith in both physician and remedy so much as a prognosis which comes true not merely to the day, but to the hour; to have a reputation for omniscience is helpful in practice, but to be blest with a reputation for prescience may be even better. During the last year or two doubts have been expressed in more than one quarter as to the permanency of the effects of "Reizterapi" (as it is known in the Scandinavian countries), and at the Bispebjaerg Hospital in Copenhagen a systematic attempt has been made by Dr. H. Jansen and Dr. E. Begtrup[1] to study the effects of this treatment on chronic disease of the joints. To make the trial as fair as possible, they dispensed with other remedies in as many cases as possible, and selected comparatively early cases of joint disease fo their tests. These were made with subcutaneous intramuscular, or intravenous injections of caseosan intragluteal injections of a suspension of sulphur in olive oil or of plain, sterilised cow's milk. Intravenou injections of collargol and subcutaneous injections o phylacogen were also given, and two new preparation not yet put on the market by their German inventors were also tested. The records of many of the case are published in detail, and common to practically every case was the observation that whether the immediate results were good, bad, or indifferent the patients were ultimately little or no better off than before. Sooner or later practically all these patient had to fall back on hydropathic and other physical remedies, the effects of which were on the whole very much better than those of "Reizterapi." The authors' fair tests and critical analysis of this treatmen may chill the ardour of some of its supporters.

THE CHILDREN'S SANATORIUM AT HOLT.

THE Children's Sanatorium at Holt, Norfolk, was originally intended only for early cases of pulmonary tuberculosis in the poor. Poverty, however, is a relative matter, and the governing body has recently decided to set aside a ward for children of middle-class parents who are not in a position to afford the necessarily high fees of private sanatoriums. The weekly charge for these patients will be £2 2*s*., and they will have the same treatment as the other children except for the sleeping arrangements. It is satisfactory to learn from the last annual report of the sanatorium that the average duration of treatment is as long as 41 weeks, and that it makes no "cure-you-while-you-wait" claims. During 1922 all the available 48 beds were occupied, and the number of in-patients was 56. We are sure that the new arrangement will materially increase the usefulness of this institution.

SULPHUR IN THE TREATMENT OF ARTHRITIS

SULPHUR has long been used in the treatment of skin affections and as an adjunct in the treatment of syphilis, but only recently has it been used at all extensively for the relief of joint affections. The chronic rheumatoid and osteo-arthritic conditions might well be placed foremost among the diseases which cause the greatest and most prolonged suffering and disability to the patient and the greatest perplexity to the practitioner, the very hopelessness of all known methods of treatment driving him to despair and leading him to expend his energy and thought on other more profitable fields of research. From the reports received it appears that sulphur given intramuscularly in the form of an oily emulsion has a specific effect on chronic arthritic conditions, and while not in every case producing complete restoration of function, affords a very great measure of relief from pain and increase in mobility, thus enabling the patient to return to a useful and comfortable existence. Dr. Herbert Hayn,[1] of Breslau, reports 11 cases of different forms of arthritis, including acute and chronic rheumatoid and osteo-arthritis, gonococcal arthritis, and gout, some of many years' duration and completely bedridden. In all an undoubted improvement was seen, most noticeable in those cases which had resisted the orthodox methods of treatment, and bedridden patients left the hospital walking. The sulphur therapy consists of intramuscular injections of a 1–8 per cent. emulsion of sulphur in oil, repeated at intervals of 5–6 days. The number of injections required varies, in the cases reported from 5–13. The immediate reaction to the injection, which is independent of the quantity given, is severe. The temperature rises within 12 hours to 40° C. and a rigor occurs, the patient complains of intense headache, eral malaise, and great pain, most marked in the ected joints. Locally there is a small circumscribed elling and slight tenderness, but no cases of abscess mation or of necrosis have been observed, nor has re been any disturbance of the function of the al, vascular, or hæmopoietic systems. The reaction sides completely in 24 or at most 48 hours and the tient feels perfectly well. Combined with the sulphur rapy, such external applications as hot air, baths, ssage, and passive movements should be persisted and it is important that these should not be itted, for it is only during the sulphur treatment at their maximum benefit can be obtained. The ult of the treatment on the joints is that there is id diminution of pain, the swelling decreases, d the range of movement is markedly increased, ile the general condition of the patient correspond- ly improves. Acute affections which respond to icylates were not treated by this method.

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[1] Ugeskrift for Laeger, June 14th, 1923.

[1] Deutsche medizinische Wochenschrift, May 25th, 1923.

MMITTEE ON THE USE OF PRESERVATIVES IN FOOD.

As we recently announced, a deputation of medical icers of health and others to the Ministry of Health, ging the need for further control in the use of food eservatives, received the gratifying assurance that committee was being appointed to consider the hole question. The personnel of this Committee is as lows: Sir H. C. Monro, K.C.B. (chairman); Prof. . E. Dixon, M.D., F.R.S.; Sir A. D. Hall, K.C.B., R.S.; Dr. J. M. Hamill; Mr. O. Hehner, F.I.C.; of. F. G. Hopkins, F.R.S.; Dr. G. R. Leighton; . A. P. Luff; Dr. C. Porter; Mr. G. Stubbs, I.C. They are asked to inquire into the use of eservatives and colouring matters in food and to port:—

1. Whether the use of such materials or any of em for the preservation and colouring of food is jurious to health, and, if so, in what quantities does eir use become injurious.

2. Whether it should be required that the presence such materials and the quantities present in food fered or exposed for sale should be declared.

The secretary of the Committee is Mr. A. M. Legge, the Ministry of Health, Whitehall, S.W., to whom l communications should be addressed.

LEGITIMATE REQUIREMENT OF OPIUM.

IN the July number of the *Contemporary Review* pears an article by Sir William Collins dealing with e present position of the opium traffic. It will be membered that Sir William Collins, together with r. (now Sir) William Max-Muller, signed, on behalf the British Government, the Convention drafted the First International Opium Conference held at he Hague in 1912. Since 1919 the League of Nations as been entrusted with the carrying into effect of the nvention, in so far as the States which are members the League are concerned. We have repeatedly ferred to the work of the Advisory Committee on pium, appointed by the Council of the League to pervise the execution of the Convention.[1] The ommittee has continued the work formerly carried t by the Netherlands Government in endeavouring secure ratification of the Convention by all the owers, and has made an attempt, in coöperation ith the Health Committee of the League, to ascertain e amount of opium, morphia, cocaine, and heroin quired for legitimate consumption, but so far with conclusive results. The problem of the "legitimate" eeds of one country and another has given rise to uch discussion, particularly with regard to India. he Indian Government takes its stand on the ndings of the Royal Commission of 1895, to the ffect that prohibition of poppy cultivation and the anufacture and sale of opium in British India would volve the destruction of the heavy export trade in engal opium to China and elsewhere, and would inflict a heavy loss of public revenue on the Government and people of India. The Commission also found that opium was a "universal household remedy," that it was "extensively administered to infants," and that it was used as a stimulant and prophylactic against malaria and fever. The Indo-Chinese trade, however, was terminated in 1917; some 14,000 chests of Indian Government opium are annually exported to meet the "legitimate requirements of the non-China markets"—the latter including the Straits Settlements and North Borneo. The Indian Government condemns opium-smoking as "essentially a social vice," and, speaking generally, it is their policy to "confine the use of the drug within the narrowest possible limits." The manufacture of opium for smoking in India is said to be prohibited except by the individual for his own use. With regard to China, it is to be regretted that this country, which was reported to be free from poppy cultivation in 1917, has since resumed a large production of opium, by the action of provincial governors in defiance of commands from Peking. In a recent issue we dealt with the estimated legitimate needs of China—2000 oz. for a population of 400 millions with a yearly sickness incidence set at 20 millions.[2] At the session of the Advisory Committee held at Geneva in June, the United States representatives pressed for limitation of production of the drugs dealt with in the Convention to the amounts required for strictly medicinal and scientific purposes. This proposition was apparently approved subject to a reservation on behalf of the Government of India, and to a declaration that so long as opium-smoking is not, as the Convention of 1912 contemplated it should be, suppressed, opium raised for that purpose is to be deemed legitimate. Sir William Collins in his article described a personal inquiry into the legitimate use of the drugs in question, as follows:—

> "With the assistance of Mr. Langford Moore, pharmacist to St. Bartholomew's Hospital, I have recently ascertained that at ten of the larger London hospitals, treating 70,000 in-patients and 550,000 out-patients a year, the amount of opium used is about 40 lb. per annum, of morphia 5¾ lb., and of cocaine just over 9 lb. These relatively modest amounts, which suffice for the legitimate medical treatment of 620,000 sick and injured persons in a year, contrast strikingly with the hundreds of thousands of kilograms of opium annually raised, and the tons of morphia and cocaine annually manufactured and exported."

These findings form another useful indication of the actual quantity of drugs of addiction which is necessary for the use of the world; it is for the League of Nations, with the aid of the United States, to strive for prevention of any output in excess of that quantity.

SIMULTANEOUS OBSERVATIONS ON GASTRIC AND DUODENAL SECRETIONS.

THE interesting studies on human digestive secretions which have emanated from the Department of Physiology of the University of Edinburgh have been extended by the introduction of a new technique. We recently published[3] an article by Dr. A. R. Matheson and Dr. S. E. Ammon describing the vigorous secretion of gastric juice which appears in the fasting human stomach in response to a hypodermic injection of histamine. In the current number of the *Edinburgh Medical Journal* Drs. R. K. S. Lim, A. R. Matheson, and W. Schlapp give a preliminary account[4] of their latest work. They introduce two tubes, the first into the duodenum, the second into the stomach, and by applying continuous aspiration to both of these they are able to recover the main bulk of the secretions both of the stomach and the duodenum; the method has the great additional advantage that the duodenal secretion is unadulterated with gastric contents, these being removed separately. Three experiments on normal subjects are described; in all of these a marked increase in gastric secretion was obtained after administration of histamine, the increase being both in volume and in concentration of acid with a resultant great augmentation in total acid secretion. In two of the subjects there was no increase in duodenal secretion, and the slight increase in the third is believed to have been due to some escape of gastric contents into the duodenum. One of the most important lessons of this work would seem to be its reiteration of the fact that patience and care on the part of the observer are the only requisites for performing extensive experiments on the alimentary canal in the human subject. Duodenal tubage for diagnostic and therapeutic purposes is an everyday procedure in several clinics both in the United States and in Austria ; our Edinburgh colleagues have again demonstrated that simultaneous passage of two tubes is a relatively easy matter and that useful observations can thus be obtained.

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[1] THE LANCET, 1921, ii., 518, 1230; 1922, i., 1004.

[2] THE LANCET, June 23rd, p. 1274.

[3] THE LANCET, 1923, i., 482.

[4] Edin. Med. Jour., July, 1923.

CEREBRAL CYSTS.

According to Dr. H. G. Jacobi,[1] of the Lenox Hill Hospital, New York, who records a case of his own, cerebral cysts are of infrequent occurrence and their detection by clinical means is extremely difficult. In most cases the diagnosis is not established until the autopsy. Of 299 cases of brain tumour in children collected by Starr, 30, or nearly 10 per cent., were cysts, which occupied the following situations : basal ganglia and lateral ventricle, 1 ; pons, 1 ; medulla, 1 ; base, 1 ; cerebellum, 9 ; and centrum ovale, 15 ; 2 of the tumours were multiple. The formation of cysts has been attributed to a variety of causes, perhaps the best classification being that of Bruns, who divided cysts into five groups according as they were : (1) of congenital origin ; (2) parasitic, due to the cysticercus or more rarely the echinococcus ; (3) traumatic, developing around spicules of bone ; (4) the result of brain softening ; (5) without any accountable ætiology. Dr. Jacobi's case, which was in an infant, aged 1 year, presented the following features of interest : (1) A sudden onset, simulating an acute infectious process ; (2) indefinite signs and symptoms, making an ante-mortem diagnosis impossible ; and (3) the presence of hyperglycæmia and glycosuria possibly due to pressure of the cyst on the fourth ventricle, as in the well-known experiment of Claude Bernard. Death took place in coma after three weeks' illness, and the autopsy showed a cyst containing creamy yellowish fluid situated beneath the posterior horn of the right lateral ventricle. From the chemical analysis of its contents, which showed that the principal constituent was pseudomucin, Dr. Jacobi is inclined to regard the cyst in his case as being of the proliferative type and of congenital origin.

THE INTERNATIONAL CONGRESS OF SURGEONS IN LONDON.

On Tuesday next the Sixth Congress of the International Society of Surgery opens at the House of the Royal Society of Medicine in London. The programme, which is an attractive one, is set out on p. 99. The Congress brings to this country a number of surgeons of world-wide distinction. The veteran Dr. W. W. Keen, of Philadelphia, now in his eighty-seventh year, expects to be present. Among the members of the committee who will take part are Prof. F. de Quervain, of Berne ; Prof. Henri Hartmann, of Paris ; Prof. Johan Nicolaysen, of Christiania ; Dr. Th. Jonnesco, of Bucharest ; Prof. C. F. A. Koch, of Groningen, and Prof. C. Willems, of Liége, the President of the Committee. Dr. William Mayo, of Rochester (Minn.), and Dr. Banting, of Toronto, will take part in the discussion on endocrine surgery ; Dr. Crile, of Cleveland, in that on operative shock. The foreign guests will receive a warm welcome, not only officially from the Foreign Minister and the Minister of Health, but also from their surgical friends and colleagues in this country.

Modern Technique in Treatmen

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

XXVIII.—THE TREATMENT OF TRAUMATI RUPTURE OF THE URETHRA.

Traumatic rupture of the urethra is a comparativel rare accident not in itself especially dangerous ; bu if mismanaged serious complications may ensue an the troublesome stricture which commonly follows ha given it an unenviable notoriety.

Pathology.—The accident occurs (*a*) without inju to the bony pelvis ; (*b*) as a complication c injury to the latter. In the former case the injur involves the urethra just in front of the triangula ligament in the region of the bulb, while in the latt it is above the ligament and therefore intrapelvi In either case the urethra may be contused withou laceration, or its mucous membrane may be partiall torn or completely severed. In contusion there ma be some submucous tearing of the urethral wall— interstitial rupture—but the mucous membrane i intact. In partial rupture a gaping wound involve the whole thickness of some part of the wal In complete rupture there is usually a complet transverse tear, when the ends retract to the exten of an inch or more and they also contract ; th tendency to occlusion is further aided by th pursing up of the torn mucous membrane an the accumulation of blood clot between the ends The laceration may, however, be oblique o irregular, or a section of the whole urethr may be pulped, so that it subsequently necroses o is converted into a mass of scar-tissue. The exten of the injury disclosed when the parts are exposed i generally much greater than would be anticipate from the symptoms and physical signs. The out standing features of urethral injuries are : (1) effusio of blood ; (2) extravasation of urine, local or wide spread ; (3) infection. Some of the bleeding occu into the lumen of the canal, escaping through th meatus, but a considerable amount infiltrates th tissues outside the urethra and between the margin of the wound in its walls. The extravasation o urine may be localised to the immediate vicinity o the injury, or may be more widely diffused into th cellular tissue of the perineum delimited by the fasci of Colles, or into the corresponding tissue outsid the peritoneum where the injury is above the triangula ligament. Infection may be limited to the parts sur rounding the urethra, with or without a localise abscess, or may follow the extravasation.

How Healing is Brought About.—When the urethra wound is kept in apposition, and there is no infection healing readily takes place with a minimum of scar tissue ; otherwise, healing can only occur slowly b granulation with the maximum of scar-tissue. I complete rupture the channel may be fortuitousl restored though seriously narrowed, but mor commonly complete obliteration of a section of th urethra occurs, the urine escaping through sinuses.

Faults in Current Teaching.—Many text-books teach that an attempt should be made to pass a cathete into the bladder, the instrument being tied in and left for eight to ten days. Should catheterisatio be impossible, perineal section is advocated, th urethra to be carefully and completely suture around an instrument. In either case large bougies are to be frequently passed for a few weeks.

Now even if a catheter can be passed, the condition are not ideal for healing. When a catheter rests in the sphincter, the latter relaxes, allowing urine to trickle by its side into the urethra towards the wound, and this invariably leads to infection. Apart from this leakage, the constant presence of the catheter itself acts as an irritant and is almost always associated with some slight infection—harmless in the normal urethra, but a forerunner of scar-tissue in a urethral wound. Again, it must be recognised that complete cular suture of any tube tends to narrow its lumen, d the urethra is neither so large nor so distensible t this narrowing can be permitted with impunity. e passage of large bougies frequently tears the freshly ited tissues, inflicting further injury which can only air by the formation of more scar-tissue; there ults a vicious circle.

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[1] American Journal of Diseases of Children, June, 1923.

The Principles of Treatment and Their Application.

Certain principles may be outlined: (1) Urine must t be allowed in contact with the damaged area til healing is complete. (2) The torn ends of the ethra must be brought into apposition. (3) No reign body, such as a catheter, must be allowed in ntact with the urethral wound during the process healing. (4) After union, the urethral channel at e site of the injury must not be re-injured by the quent passage of unnecessarily large bougies. On ese principles all cases of rupture of the urethra which blood escapes from the meatus require eration. In contusions without bleeding from the ethra the use of the catheter is permissible and may ffice, but if there is increasing difficulty or a swelling velops in the perineum, operation is indicated. here is a type of case in which the symptoms, after injury to the perineum, are often accounted too ght to need treatment; there are pain and passage a little blood, but there is little or no difficulty in icturition. In these very slight cases operation, en if limited to perineal drainage behind the site of e injury, will have happier results than expectant eatment.

Treatment must be carried out before attempts to icturate have driven urine into the tissues around e canal or involuntary escape from an overstended bladder has led to the same result. A elay of several hours may be unavoidable before the tient can be removed to a properly equipped spital or the services of an operating surgeon cured, and certain temporising measures may have be employed. The patient must be instructed not attempt to micturate; a sedative may be administered to help him to desist. If operation cannot be ndertaken within two or three hours of the accident, e bladder is distended and desire to micturate sistent, the bladder should be punctured suprapubically, using local anæsthesia, or without if a fine ocar and cannula, with aspiration apparatus, be used. he trocar is removed lest a fistula should develop, nd the puncture repeated if necessary.

Operative treatment involves perineal section, xposure and repair of the injury, and temporary erineal drainage of the bladder. The patient is the lithotomy posture in a good light and catheter or a rigid staff is passed to the site f the injury. An incision of ample length is hen made, from the base of the scrotum to near e anus, and is deepened until the urethra is eached. The site of the tear, indicated by blood-clots, hould be fully exposed and all clots wiped away or emoved gently with a spoon until the exact amount of amage is ascertained. When the urethra is completely divided it may be a little troublesome to find e retracted proximal end; urine escaping or expelled y suprapubic pressure may furnish a useful guide. have never met a case in which it was necessary to pen the bladder for retrograde catheterisation. The istal end, if not at once found, can be identified by assing a rubber catheter from the meatus. The ends nce found, can nearly always be approximated and hould be fixed together by sutures joining only the oof and the sides of the canal. The floor is then epresented by a diamond-shaped space which, when heals by the approximation of the surrounding issues, leaves the urethral channel larger at the site f the injury than elsewhere, thus allowing for some ontraction which will inevitably occur. A rubber atheter may, if desired, be passed from the distal to he proximal urethra during the process of suturing, ut in any event must be removed when the latter completed. When the tear is limited to part of the ircumference it is diminished by sutures but the loor is always left open. The approximation of the urethra being complete, the floor of the proximal end is incised in its long axis for half an inch backwards from the site of the tear. A rubber catheter, size 12 or larger, is then passed from the perineal wound through the incision in the floor of the posterior urethra into the bladder, and is fixed to the skin margin with a silk-worm suture. The catheter now lies in the posterior part of the perineal wound, while the sides and edges of the anterior part are drawn together over the sutured urethra. Only one or two stitches are necessary as the parts lie naturally in contact when the legs are extended side by side. If the urethra is pulped so that the gap cannot be bridged a catheter may be passed from the distal into the proximal segment; the segments are then drawn together as nearly as possible, the deficiency being made good by the surrounding tissues aided by any shreds of urethral mucous membrane, which are carefully cherished and laid along the catheter. It may be necessary to reconstruct the urethra with flaps of fascia lata or by some other device, but it is wonderful how often the channel is usefully restored without these aids when the urine is conducted away from the area during the process of healing. Some surgeons prefer to perform suprapubic cystotomy, but this is no more efficient than the perineal drain. While the catheter remains in the bladder it must be washed out twice daily to ensure that its lumen is kept free. As phosphates are liable to form around its end the patient must take 1 drachm of acid phosphate of soda and 15 gr. of urotropin in a glass of barley-water each day. The drainage catheter is removed in ten days, after which urine will escape from the perineum for a week or so and later will find its way through the normal channel. Three weeks after the operation, a Lister bougie 9/12 or a silver catheter No. 10 is very gently passed into the bladder; this will present no difficulty if the roof of the urethra is carefully followed. No force is permissible and no larger instrument is necessary. Three weeks later the same instrument is again used and if it passes easily need not be tried again for two months. If narrowed the passage should be dilated until it admits the 9/12 Lister, but no further. A similar instrument should be passed quarterly for a year, afterwards at increasing intervals.

Complications.—Old and Neglected Cases.

Secondary hæmorrhage on removal of the catheter from the perineum is treated by its reintroduction for 24 hours or by packing with iodoform gauze soaked in 1 in 1000 adrenalin solution. A tiny fistula persisting in the middle of the perineal wound may be cured by applications of pure carbolic or nitrate of silver fused on a straightened hairpin or a touch with a fine cautery point. In those cases in which extravasation has already occurred, the perineal swelling must be freely incised down to the site of injury and further incisions made wherever necessary. When possible the proximal urethra must be found and a catheter passed along it into the bladder as already directed, but no prolonged attempt should be made to expose the ends by dissection amidst tissues already infiltrated with sepsis. The main indication is to provide a ready escape for urine and products of infection. If this is successful the urethra may heal or a secondary operation may be carried out when the swelling has subsided.

Rupture of the Urethra Complicating Pelvic Injury.—In this condition the urethra is nearly always torn just at the apex of the prostate and extravasation occurs into the pelvic cellular tissue. The accident is an absolute indication for surgical interference and it is extremely important that it should be carried out before extravasation has occurred. Procedures already detailed may have to be supplemented by suprapubic drainage of the bladder as well as by incisions above the iliac crests for the relief of extravasation. Healing may occur with some deviation of the channel which may render it difficult to pass solid instruments into the bladder, though there may be no stricture or interference with micturition.

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Special Articles.

PROBLEMS OF ACCLIMATISATION.*

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THE preceding lecture was devoted to a somewhat comprehensive though by no means exhaustive account of intentional or unintentional white settlements in the tropics, and to a consideration of the various and varying views which have been advanced regarding such efforts at colonisation. There still remains, however, one important point which must not be forgotten, and that is the influence of altitude in modifying the climatic effects of a country in the tropic zone.

TROPICAL HIGHLANDS.

Kenya is much in the public eye at present and, so far as the British Empire is concerned, Kenya is the colony specially interested in this question. Unfortunately it is not one which can readily be answered. We know, of course, that in a climate like that of the East African highlands many Europeans can and do lead active and energetic outdoor lives. It is possible that, if native labour was not forthcoming, they could with impunity, so far as health is concerned, undertake the work which now falls to the lot of the Kikuyu and other sons of Ham. It has, indeed, been suggested that the European might labour like the native provided he knocked off work during the hot hours—i.e., from 10 A.M. to 3 P.M. This, however, would make a very short working day, which, I understand, would not satisfy the needs of the agriculturist.

The children, despite statements to the contrary, do well. I remember during the war attending a children's party at Government House, Nairobi, and being struck by the fitness and high spirits of the youthful guests. Save for the fact that they were somewhat pale, they would have compared favourably with a similar gathering of youngsters in this country. Moreover, a few children born in the colony have attained adult life and appear to be healthy and vigorous men and women. It must, however, be remembered that it is not merely a question of bodily health and energy. A weakening of will power is one of the first tokens that a hot climate is beginning to tell upon an individual and it manifests itself, as Huntington points out, in many ways, but chiefly along four lines—namely, lack of industry, irascibility of temper, drunkenness, and excess in venery. As we view the past and as the future unrolls, it will be interesting to see if some or any of these failings are in evidence, not only in the Kenya highlands, but elsewhere amongst European communities who have settled in tropical uplands. If such traits do make their appearances it will be well to recall the fact that while, as ever, several factors are concerned, climate may be playing an insidious but none the less definite part in lessening restraint. Speaking generally, the white population of Kenya is industrious and has faced manifold difficulties in a gallant manner, but it is a question if, as the long years pass, there will not be seen a tendency towards slackness, especially perhaps when the stimulus of rapid development has somewhat abated. Still, these are early days and there are scarcely any scientific data on which to base an opinion.

Steudel,[1] it is true, states that in the case of Europeans living in tropical highlands changes occur in the nervous system, if not in the first certainly in the second and subsequent generations. Indeed, he records the presence of neurasthenia amongst German who had been living at high altitudes in what is now known as Tanganyika territory. Naturally th altitude itself, provided it be considerable, com plicates the question. The matter lies outside th scope of this lecture, but those interested may with advantage consult Hingston's [2] paper as regard India, and that of Ocaranza [3] who deals with Mexico Meyer [4] has also considered the subject, so far as th blood picture is concerned, while Mackinnon [5] com menced a research at Nairobi on the cardiac condition in children. It is unfortunate that he was unable t continue his inquiries, but he has recently published an interesting paper [6] on education in its relation t the physical and mental development of European children of school age in Kenya. He finds that the warmth and light exercise a stimulating and salutary effect on growth, at least when the food condition are satisfactory. Both as regards height and weigh the Kenya children compare favourably with English children of the same age and presumably, though he does not say so, of the same social class. At first also, there is a quickening of mentality. In fact, al goes well until the age of 10 years is reached, but thereafter a gradual process of mental exhaustion and deterioration supervenes, which appears especially to affect the memory and the power of application. So much is this the case that he considers that the Government would be well advised to limit any scheme for secondary education to such children as cannot be sent out of the country, and should, by establishing scholarships and providing monetary grants, enable children after the age of 10 to be despatched to the home country for the completion of their education. Here, then, there would appear to be definite evidence of the deleterious effect of climate upon the developing nervous system. Kohlbrugge,[7] also, with a long experience of Java, considers that a tropical mountain climate is very deleterious to the nervous system of Europeans. Altitude is said to be beneficial rather than harmful, as it favours lung expansion and increases the number of the red blood cells.

STIMULATING POWER OF CHANGEABLE CLIMATE.

So far as Kenya is concerned, if we put aside any possible influence which may be exerted by the native races or the immigrant East Indians, the future of the white race inhabiting its high plateaus would appear to depend on whether or not its climate has sufficient stimulating power. Now what are the attributes which confer upon a climate powers of stimulation? Moderate changes of temperature from one day to the next play a great part—indeed, it would seem a greater part than relative humidity, though the degree of humidity is important. It should, however, be noted that Schilling,[8] a German authority on the subject, is of opinion that an equable temperature is only deleterious because it is almost always associated with a high degree of atmospheric humidity. Be that as it may, there is no doubt that the ideal climate is characterised by moderate changes with air cooling at frequent intervals. According to Huntington,[9] mental activity reaches a maximum when the outside temperature averages about 38°, that is when there are mild frosts at night. Huntington also lays great stress on the influence of storms and, from a study of history, shows how climatic changes occurred in certain regions of the world, how such changes consisted primarily of a shifting of the belt of storms, how countries like China, Mesopotamia, Palestine, and Egypt, which in the olden days lay within the storm belt, possessed great civilisations and intelligent and vigorous people, and how, with a change of climate, there was retrogression. His "pulsatory hypothesis" of climate, as he terms it, signifying that changes have taken place irregularly in great waves, is certainly well worthy of consideration, as is the theory he has evolved from it, even if he finds it difficult to explain on his hypothesis the ancient culture of Indo-China and Ceylon. We cannot, however, follow him further in his argument; revert-to Kenya, it may be said that while limited portions the high tablelands would appear to be blessed with matic conditions which should suffice for purposes stimulation, it is, to say the least, doubtful if this be predicated of the whole elevated area over ich white settlers are scattered, and more especially Nairobi and its immediate neighbourhood. Still, ly time can show, and it should be remembered at we do not yet know if marked changes in the hours as, say, between the day and night tempera-re or even considerable diurnal variations, can make for the differences of season as experienced in nperate lands. The future is, as it were, upon the ees of the gods and, as we shall see, there may yet developments which will modify the climate or able men to defy it.

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* The second of a series of lectures, delivered at St. Bartholomew's Hospital on June 14th under the auspices of the Academic Council of the University of London. The first lecture appeared in THE LANCET of June 30th.

CLIMATE AND HUMAN METABOLISM.

Having considered the broader aspects of this estion of the influence of tropical climate upon the ite races of mankind it is time to discuss its effect human metabolism in more detail. Huntington ens the influence of climate upon men to that of a iver upon his horse, and the simile is both homely d apt. He says :—

> “ Some drivers let their horses go as they please. Now d then a horse may run away, but the average pace is slow. ch drivers are like an unstimulating climate. Others ip their horses and urge them to the limit all the time. ey make rapid progress for a while, but in the end they haust their animals. They resemble climates which are ways stimulating. In such climates nervous exhaustion is ely to prevail and insanity becomes common. A third pe of drivers first whip their horses to a great speed for mile or two, and then let them walk slowly for another ile or two. They often think that they are accomplishing eat things, and they are better off than the two types ready mentioned, but they still have much to learn. ey are like a climate which has a strong contrast of seasons, e being favourable and the other unfavourable. Still fourth kind of driver may whip his horse sometimes and metimes let him walk, but what he does chiefly is to urge e animal gently with his voice, then check him a little with e rein. By alternate urging and checking he conserves the imal's strength, and in the long run can cover more stance and do it more rapidly than any of the others. ch a driver resembles a climate which has enough contrast seasons to be stimulating but not to create nervous nsion, and which also possesses frequent storms whose nction is to furnish the slight urging and checking which e so valuable in the total effect, although each individual pulse is almost unnoticeable.”

Now, save as regards the fourth type, which cannot e said to exist in the tropics, it is possible to cite untries within the torrid zone furnishing examples these varieties of climate. The first, the unstimu-ting, is that met with along tropical littorals, as, r example, the West Coast of Africa, in great forests ke those of the Amazon, or in islands like most of e West Indies or the Polynesian archipelago. The cond type, producing over-stimulation, can be und only at high altitudes such as exist in the Andes. arts of Peru—as, for instance, the region of Cuzco—ay be cited. The third type, where there is one vourable and one unfavourable season, may be xemplified by desert climates like those of the orthern Sudan or Mesopotamia. In both countries he winter is bracing and pleasant, and in both the ng and trying summer is hot as Tophet. Hence it not surprising that the former has been described s a country where white women lose their looks nd white men their energy.

Speaking broadly, the seasonal changes of a tropical limate, if at all marked, are beneficial rather than therwise. It is tropical weather that is to blame, nd it is at fault because it has not the characteristics f what we call weather in this country. There is ar too much climate and far too little weather in the ropics. One is reminded of the schoolboy's essay on arriage customs wherein he spoke of the state of aving one wife which, according to him, is called monotony.” The simile is not a bad one, for in both ases the even tenor of existence may be punctuated y storms !

From what has been said it must be clear that an equability of temperature, a powerful sun, and a high degree of atmospheric humidity are the climatic factors which in the moist tropics at least militate against the comfort and well-being of the white settler. In the dry tropics, excessive dryness of the air, together with sun and heat, is operative, and this combination is frequently associated with electrical states of the atmosphere which may conceivably play a much more important rôle than has hitherto been attributed to them. Whether that rôle, however, is deleterious or the reverse remains to be decided. It may be a cause of mental irritability. On the other hand, it may exercise a beneficial, stimulating effect. Kullmer,[10] an American geographer, was inclined to think that possibly electrical phenomena accompanying the barometric changes which induce storms had much to do with the advancement of civilisation. It is conceivable that the comparative innocuousness of desert climates in the tropics is due to the frequency and force of electric disturbances. The air at times becomes very highly charged, and it is astonishing how a blanket on the slightest movement will crackle and spark. I would suggest that this is a line of investigation well worth pursuing. Considering the amazing electrical developments of late years, who can say that such a study might not lead to the discovery of methods whereby the stimulating and rejuvenating action of electricity might not be utilised to counteract the depressing influence of a hot and humid climate ? In such climates the effects of a severe thunderstorm are often remarkable. I recall a suffocating night on the Magdalena River in Colombia when one could scarcely breathe, so great was the oppression of the atmosphere, and the remarkable change produced in half an hour by a violent outburst of electricity.

PSYCHOLOGICAL EFFECTS.

Whatever the factors at work, the effects they produce may be classed as physiological, psychological, and pathological. Of these the greatest are the psychological, for Cuvier's axiom, already quoted, must ever be borne in mind. The psychological effects are purely subjective and we are always conscious of them, which is by no means invariably the case as regards the physiological, and yet, though in many cases no proof can be advanced, the psychological effects are probably in every instance based upon physiological change. At any rate, it is better not to try and divorce them, but to consider the psychological effects as part of the physiological effects on the nervous system. It is true that these latter effects may be associated with psychological results, without there being any direct action on the nervous system, for the change may be induced in the circulatory or other apparatus, but the expression of the psychological effects must needs be through the brain. Although a consideration of the effects of a tropical climate on the individual may not supply data for determining the influence it will exert upon the white race viewed in the light of colonisers, yet this aspect of the subject cannot be wholly neglected. Indeed, it furnishes the greater part of the scientific evidence on which any conclusions can at present be formed. Unfortunately, the evidence is conflicting and far from being complete. I do not propose to discuss all the work that has been done on the physiological and pathological effects of tropical climates. It seems wiser, considering the magnitude of the subject, to refer very briefly to some of the more important observations made in the past and then to concentrate on recent contributions to the literature, commenting, where it seems desirable, on the statements and views which have been advanced and confining myself as much as possible to the hygienic aspect of the question.

BODY TEMPERATURE.

Naturally considerable attention has been directed to body temperature, but the earlier records leave much to be desired owing to the conditions under which the observations were made. There seems however, now to be a general agreement that when one passes from a temperate to a tropical climate a slight rise of body temperature, rarely exceeding 1·5° F. occurs, while after arrival in the tropics the body temperature of the newcomer tends to remain slightly elevated. Adjustment of temperature, however, soon takes place in most cases, though there are certain individuals, obviously unfitted for tropical life, who do not possess the power of adaptation. Caspari and Schilling,[11] who carried out some interesting comparative experiments on metabolism in Germany and the West Coast of Africa, found that an ordinary and well-balanced diet had no influence on body temperature either in the acclimatised or non-acclimatised European. Neither has moderate exercise, but, according to Young, Breinl, Harris, and Osborne,[12] who conducted investigations in North Queensland, prolonged exercise does cause a rise of temperature even in acclimatised persons. It is important to take the temperature in the rectum, not in the mouth or axilla. As Leonard Hill[13] has pointed out, atmospheric conditions in the tropics undoubtedly impose a strain on the heat-regulating mechanism of the body. Hence the very effort to keep the temperature normal tends towards exhaustion, and unfavourable conditions of diet and clothing, at least when combined with considerable or severe exercise, raise the body heat.

Skin Reaction.

Closely associated with the question of body temperature is that of skin reaction, because the regulation of body temperature is secured by the evaporation of water from the surface of the body as well as from the lungs. Aron,[14] in Manila, showed that the brown-skinned man possesses a more sensitive cutaneous heat-regulating apparatus than his white brother. This is presumably due in the first instance to colour, as brown skin absorbs more heat than white skin and hence more rapidly, as the result of nerve stimulation, the stage is reached when perspiration shows itself. Moreover, brown skin cools more rapidly than white skin. On this account, as well as for other reasons, tanning of the white skin is beneficial and the lack of it is doubtless, in part, a cause of the poor adaptability to heat which the white woman who lives indoors or carefully guards her complexion usually displays.

I have spoken about brown skin absorbing heat. What really happens is that the light rays pass through the cutis till they strike the pigment layer where they are converted into heat. In the case of the white skin the light rays pass right through and the conversion into heat takes place as the result of the action of the blood pigment. A thin skin is a useful asset in promoting conduction, for the horny layer is a very bad conductor of heat. The brown or black man, protected by his pigment, does not require a thick, horny layer, but it is significant that Priestley [15] has noted a coarsening of the skin of white women in tropical Australia. Had these women done field work their skins might have become tanned instead of thickened. Of two evils it were well to choose the lesser. Persons who do not perspire or who have a defective sudorific system are unsuited to residence in the tropics, and in the case of prospective settlers inquiry should always be made on this point. A defect of this kind may be transmitted to the offspring.

Respiratory Exchange.

Little need be said about respiratory exchange. The lungs, which by the evaporation of water from them aid the cooling process, weigh less in hot than in cold or temperate climates, because the place of the blood which passes to the warm body surface is taken by air. Pulmonary capacity is therefore increased, but the lessened number of respirations preserves the necessary balance. In the tropics the air which is inhaled is rarefied by heat and so contains less oxygen than cold air. The respirations being reduced in number and less oxygen inspired, less carbonic acid and water vapour are given off by the lungs. As a result there is a tendency to the retention of carbonaceous matter in the blood. So far as I can discover, r ill-effects have been attributed thereto, but it conceivable that it may tend towards fatigu Young [12] and his co-workers showed that alveolar air at rest in inhabitants of tropic Queensland exhibited a lower carbon dioxide conte than the European average.

Blood.

The blood is the life, and, as might be expecte numerous observations have been made in vario parts of the world on the blood state of Europeans the tropics. It is possible that they began with thos of Mayer carried out at Java in 1840, when on bleedin his patients he noticed that their venous blood w much redder than he had found it when venesectin in Germany. His deductions from this phenomeno however, concern basal metabolism, and will considered later. There is some doubt as to wheth climate alone can produce any change in the forme elements of the blood. There is no certain eviden that it produces anæmia, the pallor of old tropic residents being merely skin deep, due to a local vas motor condition, a cutaneous ischæmia, as Musgrav and Sison[16] maintain. Certainly, so far as the Phili pines are concerned, Chamberlain[17] has shown th the blood of white men after a year or more residence is well up to standard. On the other han Mitchell,[18] a British naval surgeon, declares that th damp heat of the Persian Gulf produced a simple b severe anæmia in cases under his care. Unfortunatel he gives no blood counts, although he states th the blood was examined. His conclusions are n convincing.

It is possible that climate may produce changes the hæmoglobin. Thus Plehn,[19] working in th Cameroons, found evidence of hæmoglobinæmia, whil Gibbs,[20] in Manila, showed that ultra-violet ligh can transform oxyhæmoglobin into methæmoglobi According to Harston [21] the blood of children in th tropics shows a diminution in the percentage hæmoglobin, though the red cells are increase relatively to the fluid elements of the blood, becaus the latter is more concentrated owing to excessiv perspiration. He considers the lessened hæmoglobi content to be due to: (1) The fact that heated a contains less oxygen per cubic foot than cool air (2) the slower respiratory exchange to which referen has already been made; (3) the depletion of blood the lungs which has also been mentioned.

Some sound work was carried out not long ago b Kop,[22] who, at Weltevreden in Java, investigated th blood of 93 normal healthy individuals—55 Europea and 38 natives. The blood counts were made o films taken with due precautions before 9 o'cloc in the morning from subjects with empty stomach In each case the red and white corpuscles wer enumerated, the hæmoglobin index was determine a differential leucocyte count performed, and th Arneth index noted. No difference of any kind wa found between the blood of these people and that dwellers in temperate climates, save that the native had eosinophilia, doubtless due to infection wit intestinal worms. Elsewhere a shift to the left in th Arneth count has been described, possibly indicatin a lowered resistance to disease, but the records a not very satisfactory, and in all likelihood Kop results are generally applicable. The lymphocytosi which has occasionally been observed is probably pathological symptom not due to climate. It mus however, be noted that observations in the Egyptia deserts by Bickel, Loewy, and Wohlgemuth,[23] an amongst the Djerids of South Tunis by Grober [2 have conclusively shown that under the peculia climatic conditions obtaining in these regions there an increase in the erythrocytes and hæmoglobin It has been suggested that the peculiar and intensiv light conditions prevailing in the desert stimulate th blood-forming organs, just as experimentally the ligh of a mercury lamp induces in them a fresh activit resulting in red cell increase. It is conceivable tha such a stimulant action mitigates the ill-effects o e hot and arid regions, and renders them less ng, in the long run, than the humid tropics.

obably of greater importance than the question of iges in the formed elements of the blood and the ioglobin is that of its chemical or physico-chemical titution, though here we are on debatable ground. nsideration of the scanty literature on the subject hasises the pressing need for bio-chemical work in tropics. The bacteriologist, the protozoologist, pathologist, and even the epidemiologist, have hrown light upon tropical hygiene, but, with some ible exceptions, the physiologist, and more cially the bio-chemist, has not yet come into his in this realm of research. I was sorry to see some time ago the proposal to attach a bio-chemist he staff of the London School of Tropical Medicine negatived. His help would have been valuable i in this country, but there is a great field for him ad, more especially in the direction of blood work.

Dutch, who are very much to the fore in all ters pertaining to tropical hygiene, have been k to realise the importance of bio-chemistry in r tropical possessions. De Langen and Schut[25] [26] nated the sugar content of the blood in native ans and Europeans and in rabbits, guinea-pigs, and s in Java. In all it was high, and in the case of opeans and of the animals considerably higher n is the case in Europe. This hyperglycæmia is ost certainly associated with a deficiency in ium and a reduction in the cholesterin of the od. The Dutch observers ascribe the condition to t. Humidity, it is said, may also play a part by nulating the sympathetic nervous system which ılates the function of the suprarenal glands. hepatic glycogen is no longer stored up as usual, sugar content of the blood increases, and an mpt is made to throw off this excess of sugar in the ulating blood. It is eliminated through the neys, the so-called renal glycosuria, or is burned up. the latter event is ascribed the "low fever" of tropics which, if the Dutchmen are correct, has a natic, not a parasitic cause. As hyperglycæmia poses to neuritis and polyneuritis and favours asion by the tubercle bacillus it will be seen that research has an important bearing on the subject are discussing. The condition cannot be the same the hyperglycæmia observed by McCay[27] in ngal, and which he attributed to excessive carbo- lrate diet, for it appears soon after the arrival of ropeans in the tropics.

De Langen and Schut[28] have also investigated the content of the blood. A reduction in cholesterin already been mentioned, and two-thirds of the od-fat is cholesterin. The total fat content is newhat higher in Europeans than in natives. It uld take us too far afield to consider all their dings and deductions, but it may be said that the tter may have important bearings on diet in the pics, for the blood lipoids which constitute the fat e proper—that is, the finely emulsified fat present the serum either in a colloidal or invisible form— uld appear to be intimately concerned with cell life d function. The difference in the cholesterin ntent of the blood of natives and Europeans was not ought to be wholly due to differences in diet. Langen[29] invoked a special function of the docrine glands to explain it, while Verhoef[30] was lined to attribute it to climate. Now, however, it uld seem that de Langen[31] has revised his views d is prepared to put down the low cholesterin ntent, in native convicts at least, to a scarcity of in the diet. The matter is still sub judice, and I ly mention it as showing how much we are in the rk as regards these difficult but suggestive problems.

ie percentage of water in the blood of healthy lividuals in the tropics has been shown to be prac- ally the same as that of Europeans at home—i.e., ·6 per cent.

So far as *circulatory change* is concerned the observa- ons are very contradictory. I would therefore merely ention that the Australian workers at Townsville[12] und that humid heat produced a rise both in blood pressure and pulse-rate, while de Jonge,[32] working in the Dutch East Indies, maintains that the maximum blood pressure of Europeans does not diminish as the result of prolonged tropical residence.

Digestion and Excretion.

A hot climate at first stimulates digestion and the digestive functions, but the effect is evanescent, being soon followed by a diminution in appetite and some lowering of digestive activity, with an accompanying lessened desire for animal food. It is interesting to note that recent American experiments on dogs show that in hot weather the secretion of bile may strikingly diminish even if the food intake remains considerable.

The urinary excretion is diminished in the tropics, the daily output being about 500 to 700 c.cm., as against 1500 in temperate regions. The urine is concentrated, but it is a moot question whether or not it contains an equal amount of waste material to that found in the 1500 c.cm. Some say one thing, some another. Young,[33] in North Queensland, found the neutral sulphur content high, but was unable to say whether or not this was due to increased tissue metabolism. He noted a much higher specific gravity of the urine,[34] a diminution in the quantity of sodium chloride excreted and a lessening of the total nitrogen.

McCay,[35] in Bengal, did much work on Asiatics; but of more importance for our purpose are the observations of Campbell[36] in Singapore, a place where there is no cool season and the temperature averages 80° F. all the year round. There he found that race had no influence on the nitrogen partition and that for a European, a Eurasian, and several races of Asiatics alike the absolute quantities of total nitrogen, of urea nitrogen, and of uric-acid nitrogen were much lower than the standard figures for Europe. On the other hand, the percentages of urea nitrogen and uric-acid nitrogen did not materially differ from the standard, while the percentage of ammonia nitrogen was increased and absolute ammonia nitrogen was also often increased. McCay[27] did not estimate the creatinin nitrogen, dealing only with neutral sulphur. Campbell found the amount to be slightly lower than the European standard but the percentage higher.

In a Chinese, a European, and a Eurasian the total nitrogen per kilo of weight proved to be about the same as the standard. In other races it was lower. Campbell attributed the low results to the indirect effects of heat and humidity which lessen the desire for food and work, thus leading to poor physique and less muscular energy. This may be true in the case of the European and the Eurasian, but recent work by Read and Wang[37] at Peking in China, at a time when the weather was dry and cold, work carried out on Chinese and yielding results comparable with those of McCay, Campbell, and Young, would seem to show that the differences noted are entirely due to diet. In other words, an exogenous rather than an endogenous factor is at work, and the high cereal diets are probably the cause.

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(*Continued at foot of next page.*)

NATIONAL BABY WEEK CONFERENCE.

(*Continued from p. 33.*)

THE subject under discussion on the morning of July 3rd was the

Scope, Staffing, and Administration of an Infant Welfare Centre,

the points for consideration being well set out in an introductory speech by Mr. H. O. **STUTCHBURY**, the chairman. In regard to staff, the Ministry of Health had an open mind as to the relative values of a whole-time medical officer appointed by the local authority, a specialist in child welfare, and a general practitioner, always provided that the doctor had special knowledge of children's health. A medical officer doing nothing but children's work was apt to suffer from monotony, and there was, he thought, little to be said in favour of a rota of doctors, as continuity in advice and treatment must necessarily be lost.

Dr. W. G. **WILLOUGHBY** considered that it came within the scope of a welfare centre to procure or provide medical treatment for cases in which treatment was unlikely to be obtained otherwise. If the medical part of child welfare was universally carried out by private practitioners, the centres could confine themselves to dealing, at most, with minor ailments; at present this was not the case, and many children would remain untreated but for the work of the centres. The scope of the welfare centre was to fill any gap in the measures for preventing suffering to children, even if temporarily it ran up against other interests. An experienced medical chief was the first essential of a satisfactory staff, but Dr. Willoughby also placed great importance on highly trained health visitors for the homes. In Eastbourne the service of home helps had been found invaluable.

Dr. **MABEL BRODIE** said there were three sides to the work—educational, medical, and social—and the first and last could be carried out by competent volunteers. Talks should be given, where possible, on health, sanitation, psychology, mothercraft, and housecraft, and in some cases such subjects as gardening and poultry-keeping might be included. It was desirable that where special home treatment w recommended, it should be demonstrated at the cent Many mothers had no idea how to make a poultice administer an enema. Often there was no distr nurse to show them, and the health visitor had n time. People going into the newer type of hou required instruction as to the respect due to the ba and sanitary arrangements, if these are to be kept working order. Dr. Brodie would like the centres be in the nature of mothers' clubs rather than ou patient departments, and to provide reading and r rooms, and, where possible, a bath, which would greatly appreciated by the mothers. The medi side should be preventive, but we had not reach that ideal at present, and minor dressings at lea should be done at centres in places where there w no district nurse. Efficient medical officers were necessity; whether male or female, it was essent that they should love babies, understand mothe and be acquainted with the social affairs of the distri

Dr. E. **ROWLAND FOTHERGILL** (representing t British Medical Association) said it was necessary distinguish clearly between the centre and the clini The object of the centre should be educational a advisory, and medical treatment should not be giv for any condition which, in the absence of the cent would be recognised as calling for a doctor's atte tion. Mothers or children requiring medical treatme should be referred to the family doctor or, where the was no family doctor, to the clinic. The gener practitioner was the pivot and anchor of the peopl health, and every means of education and experien should be placed at his disposal.

Dr. **HAROLD SCURFIELD** said it sometimes seem to be thought that babies and disease were invent for the benefit of the medical profession. The impo tant thing was to get the necessary treatment a cure; it was useless to search out disease unless it w to be followed up by treatment. The panel syste dealt with the worker, but there was at present medical service at the disposal of the family.

The question of the advisability in urban areas combining the functions of health visitor with those other officers led to the expression of views on t whole more in favour of unification than against it.

Dr. W. E. **HOPE** (M.O.H. Liverpool), in a paper rea in his absence by Dr. S. G. **MOORE**, gave some accou of the evolution of public health work in Liverpoo and laid down the principle that certain prelimina training and experience were required for all healt visitors, who, with this background, could readil assimilate special instruction to fit them for oth branches of work.

Dr. F. E. **WYNNE** thought the same tests in regar to specialisation ought to be applied as in medicine surgery. In both cases the worker needed to have sound knowledge of the whole field first, and the the particular section chosen should be sufficientl wide to occupy the whole energies of the specialist. was almost impossible to avoid some overlappin while different branches of public health work wer under separate Government departments.

In the final session on

Housing in Relation to Infant Welfare

Dr. **MARION COCKERELL** gave a moving picture the tenement house as she knew it in the borough St. Pancras. It was common for a whole family t live in one room, and in most tenement houses the were no conveniences. Cooking had usually to b done on an open fire, and there was one sink, one w.c and one dustbin for the whole house, all of which we only as clean as the least clean inhabitants. A hous might be healthy as a whole, and yet people in certai rooms might be living in bad conditions. Those i the basement got no sunshine, and the babies showe poor resistance to disease of any kind. There we two possible remedies: first, to build new house self-contained and easy to keep clean; and secondly to help some of the population to move into th country and live, not in mere suburbs, but in garde cities.

(*Continued from preceding page.*)

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(*This lecture will be concluded in a coming issue.*)

PEN-AIR TREATMENT OF SURGICAL TUBERCULOSIS.

A VISIT TO ALTON.

'HE vice-presidents, companions, and local honorary
etaries of the Queen Alexandra League were
ertained by Sir William Treloar at Alton, Hants,
July 4th, on the occasion of the visit of Sir Clifford
outt. Sir William Treloar, before introducing Sir
ford Allbutt, stated that the League was founded
years ago by Queen Alexandra for the purpose of
ecting money for the Lord Mayor Treloar Cripples'
spital and College, and during last year had
sed over £9000.

Address by Sir Clifford Allbutt.

Sir Clifford Allbutt, after expressing his great
asure at having this opportunity of seeing the
narkable work in progress at Alton, quoted Sir
thony Bowlby as saying that the glory of Alton
l abated surgery and that the old treatment of
ision of joints had passed into oblivion. He gave
rief outline of the progress of medical knowledge in
pect to tuberculosis, recalling the coddling treat-
nt of this disease when even the keyholes were
ffed with cotton-wool in order to lessen the possi-
ity of a draught reaching the patient. Tubercu-
is, spread by infection, was a general disease,
refore local excision was not the best treatment.
e value of open air, good food, and above all
nlight as means to increase the natural resistance
s very potent. He stressed the importance of
ecise dosage and careful distribution in sunlight
atment in order that perils should be avoided and
ccesses won. From Hippocrates onwards the law of
iprocal action, the ability of Nature to hit back, had
en continually demonstrated. The intrinsic natural
action of the individual was often strong enough to
thstand infection. Open air increased the fortifica-
ns of the physiological reactions and replaced
tural exercise in keeping the patient healthy.
ton was fortunate in having a pavilion with 50 beds
Hayling Island. Sir Clifford Allbutt paid a tribute
Rollier for his work in heliotherapy and occupation
erapy; at Alton 14 teachers and four technical
structors were employed to keep the patients
ppily occupied. To the importance of early treat-
ent and the value of following up cases after dis-
arge he largely attributed the successful results,
clusive of accidents, in 95 per cent. of the cases
nt to Alton. Sir Clifford Allbutt concluded by
ating the two modern events which had given him
e greatest pleasure—the remarriage of surgery with
ternal medicine after their long divorce, and the
rmation of an institute of comparative medicine at
mbridge.

The Work at Alton.

The work at Alton is too well known to need
tailed description. Amongst its many interesting
atures may be mentioned the observation ward
here each new patient admitted is kept for a period
at least a fortnight in quarantine. Each child
cupies a separate cubicle and during his stay the
se is worked up, his educational standard ascer-
ined, X rays taken, and necessary splints manu-
ctured. After that the patient is warded—or
ther gradually acclimatised to open air and sun-
ght—not according to age or medical classification,
it according to his standard of intelligence and
hool class. Non-inflammable perforated celluloid
asters and various splints and methods of extensions
vented at Alton are in use with remarkable results.
he difference in degree of pigmentation was con-
derable, every child having an individual reaction to
nlight. The red-haired, much freckled white-
kinned type are unable to tolerate exposure and
ave consequently a less hopeful prognosis. The
eds in the "Hampshire" ward are heated electric-
lly, Alton being the first hospital to adopt this
ethod. In sharp contrast to cases of surgical tuberculosis as seen in a general hospital or out-patient department is the total absence of muscular wasting. This is attributed to the action of open air on the skin—a loin cloth and sun hat is generally the only covering. The effect of fresh air on naked skin has been proved by Dr. Leonard Hill, Dr. Argyll Campbell, and Sir Henry Gauvain to increase greatly the metabolism of the body. It is stated that the pigmented patients at Alton, even though suffering from surgical tuberculosis, have their working capacity increased on an average by 37 per cent. beyond that of normal healthy children.

Alton is a striking example of what a hospital, situated in ideal country surroundings, supplying its own vegetables, fruit, pigs, and eggs can do for its patients.

MEDICINE AND THE LAW.

LIABILITY FOR IMPURE WATER-SUPPLY.

AFTER litigation extending over two years the High Court of California, U.S.A., has recently awarded substantial damages, to be paid by the city authorities, to 19 persons who contracted typhoid fever at Pittsburgh, in consequence of a breakdown in the apparatus for purifying the city's water-supply. This is drawn from the Sacramento river, the water of which is recognised as unfit for drinking until properly treated, and at a date preceding the outbreak of typhoid, from which the plaintiffs suffered, the chlorinating plant was for a time inoperative owing to the fixtures upon a drum containing chlorine gas not permitting of its attachment to the pumping system until the necessary alteration of the fittings had been made. The court has held that an obligation lies upon the city authorities who distribute the water to use all reasonable precaution to render it fit and wholesome. Presumably, in terms familiar in our courts, the judgment was to the effect that there was negligence in not securing a supply of chlorine gas in a receptacle suitable for use in the machinery installed for the purpose, and in allowing water to be supplied in a condition known to be unsafe, and without warning to the public. Subject to any special provision not likely to be inserted in any water company's Act, there can be no reason why such an action should not lie in this country in similar circumstances.

AUTHORITY TO ENGAGE AN AMBULANCE.

At Romford County Court recently his honour Judge Crawford tried an unusual action, in which the Romford Urban Council sued a Mr. Thwaites for payment for the use of the town ambulance to convey him to a London hospital. Mr. Thwaites denied liability and said that he could have travelled by omnibus or similar conveyance, and that the ambulance had been ordered by his medical attendant, Dr. V. Levy, without his authority. Accordingly the Council had joined Dr. Levy as a defendant and he was represented at the trial by Mr. H. F. Dickens, briefed by the solicitor to the Medical Defence Union. As to the main facts there was no dispute. Dr. Levy had attended Mr. Thwaites, who was suffering from severe abdominal pains, and on receiving a second summons decided that the case was one of urgency, and accordingly, on his way to his patient's house, asked for an ambulance to be sent at once to take him to a hospital. He told the court that he would have been running a great risk if he had allowed any delay to occur. On Mr. Thwaites saying that he could have travelled in an omnibus or tram-car Judge Crawford asked, "Don't you think that the doctor was the best judge of that?" In giving his decision, Judge Crawford compared the case to that of the captain of a ship who when out of reach of his owners had to come to a decision and take responsibility on their behalf. A doctor in a similar case of great urgency became, in his opinion, an "agent by necessity" and was fully justified in taking whatever steps he might think necessary in his patient's interest. Ambulances were modern inventions to secure the safe conveyance of patients, and though he knew of no parallel case, the principles of the common law would apply. If the man had died he had no doubt that his relatives would have blamed the doctor if he had not taken proper precautions. Such cases must often arise, but the question of payment had not before been contested by the patient. The defence was one of the most discreditable he had ever known. He agreed that the matter was of great interest to the general public and to the medical profession, and in giving judgment with costs against Mr. Thwaites for the amount claimed by the Urban Council, he ordered him to pay Dr. Levy's costs and certified for the costs of counsel who appeared for him. Dr. Levy is to be congratulated and also the Medical Defence Union, who no doubt will record the case as a valuable precedent for the application of the law of "agent by necessity" in medical matters.

VIENNA.

(FROM OUR OWN CORRESPONDENT.)

Treatment of G.P.I. by Inoculation of Malaria.

INTEREST has been aroused by a further communication made to the Vienna Neurological Society by Prof. Wagner-Jauregg, dealing with the results of treating 300 severe cases of general paralysis of the insane by infecting them with tertian malaria. In 1890 Prof. Wagner-Jauregg produced a "curative" febrile condition in such patients by inoculating old tuberculin (Koch). Cases were taken without selection, and it was apparent that the febrile cases had a better expectation of life. He then combined the tuberculin treatment first with mercurial treatment, later with salvarsan, and the results were comparatively satisfactory. In 1909 a report on these results was given at the International Medical Congress in Budapest; some of the patients referred to in that report are still alive and actively working. Of the total number of 86 cases, 23, or 27 per cent., could be classified as having regained full fitness for work; 50 per cent. had lasting remissions. Early cases had better chances of recovery than inveterate cases. Improved results were obtained by the use of polyvalent typhoid vaccine (Besredka), which produced more lasting febrile attacks, and remissions after its use were decidedly longer. Wagner-Jauregg noted that an intercurrent infectious disease, occurring in such patients when they were under the influence of tuberculin or typhus vaccine, produced a definite cure. In 1917 he resolved to infect such patients with the plasmodium of tertian malaria. Nine patients were taken as a first experimental group; of these, 6 are at present (i.e., six years later) perfectly well and fit for work; three had long periods of remission. Having kept this first group under observation for two years, Wagner-Jauregg then conducted large-scale experiments, and his clinic now contains records of over 300 cases treated in this way. The method seems to be the most successful of all known and is applied as follows: Tertian plasmodia obtained in vivo are injected intravenously; an incubation period of 8–14 days follows, and then comes the typical attack. The patient is allowed to undergo 8–10 attacks of fever, and quinine sulphate is then given in the orthodox way; this treatment is followed up by neo-salvarsan injections, which have lately been combined with cerebro-spinal drainage. In 1920 a series of 25 cases, with 9 complete cures, was demonstrated at the meeting of German natural scientists at Nauheim. In 1922 the number had gone up to 294 cases, with 112 complete cures, and 88 long remissions (reported at Leipzig). The improvement is noted some time after the fever treatment; it continues to increase gradually until a full remission is observed. It was found possible to transform an incomplete remission into a complete one by repeating the whole series of treatment. Reports of observations of the same nature have come from numerous other places—e.g., Graz, Heidelberg, Göttingen, and Munic Another important observation has been made Prof. Kyrle (assistant of Prof. Zinger) on the treatmen of secondary manifestations of syphilis by injection tertian malaria with very satisfactory results. Th experiments are not yet concluded, the time being st too short for definite conclusions to be drawn, b there seems reason to envisage the possibility radical cure of syphilitic infections by combine malaria-salvarsan treatment.

Closing of All Schools for Dental Mechanics.

By an order of the Board of Health the existin schools for technical dentistry open for non-medic pupils will be permanently closed at the end of t summer term. This is the final result of the "Dent Mechanics Act," introduced in July, 1920, by which a dental work in the mouths of patients is handed ov to medical men only. The dental mechanic will i future only serve as an apprentice or qualified workma in the workshop of a dental surgeon; instruction i technical dentistry will be obtainable exclusively i dental clinics, open only to doctors of medicine. Th non-medical dentists at present practising will retai their position, which will even be a little extended in s far as they are permitted to extract teeth and to fi and treat diseased roots. The apparatus of the onc famous Dental Mechanics School of Vienna will b handed over to the Vienna Dental Clinic. The A also terminates dental practice under titles such a "doctor of mechanical dentistry" and "licentiate dentistry" obtained abroad.

Vaccination Against Measles.

At a recent meeting of the Vienna Medical Societ a report from the "Mautner Markhof Children Hospital," presented by Prof. Leiner, recorded result obtained by the method of Dr. Degkwitz, of Munic of vaccination against measles. This disease has tendency to become very dangerous every third yea especially with children below the age of one yea In the 1919–20 epidemic older children were als frequently fatally affected, and in 1922–23 the winte season was again accompanied by severe mortalit particularly in several children's hospitals. D Degkwitz took 60–80 g. of blood from children in th convalescent stage of measles and prepared from i a serum, of which 3 c.cm. were injected intramuscularly into children in direct contact with measle patients. The earlier this prophylactic immunisatio took place the better were the results seen. If set up o the second to the fifth day after contact it was stil efficacious, being less protective on the sixth to th eighth day, although even then the course of the diseas was mild and transient. The control experiment conducted in Vienna have fully confirmed the claim made at Munich, and the serum will be manufacture in large quantities for use in private practice.

Prophylactic Inoculation of Dogs Against Rabies.

In my letter of June 13th[1] a paragraph referred t anti-rabies measures in Austria. The following information may now be added. Prophylactic inoculation o dogs against rabies has been undertaken in Vienna of 90 animals inoculated according to Pasteur' method, and then subjected to an "experimental" bite by a diseased animal, not one developed rabies There is a growing desire among the public for genera anti-rabies inoculation of the dog population. Fou injections of vaccine on four consecutive days would it is estimated, cost 30,000 kroner (2*s.*).

Autumn Post-Graduate Courses.

The Medical Faculty of Vienna will hold a post-graduate course for Austrian and foreign practitioners from Sept. 17th–29th. Lectures will be as follows:—Sept. 17th: Errors in Diagnosis of Diseases of th Eye; Diagnosis and Treatment of Trachoma; Cataract; Strabismus.—Sept. 18th: Vertigo; Pain in the Study of Otology; Important Surgical Indications in Diseases of the Ear; Deafness; Tonsillectomy.—Sept. 19th: Traumatic Neuroses; Diagnosis

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[1] THE LANCET, June 23rd, p. 1284.

Early Progressive Paralysis; Treatment of Pro-
ssive Paralysis; Psycho-analysis.—Sept. 20th:
berculosis in Children; Stridor in Children;
asitic Worms in Children; Differential Diagnosis
he Exanthemata.—Sept. 21: Deficiency Diseases;
buminuria in Children; Syphilis Neonatorum;
vice to Mothers.—Sept. 22nd: Prevention of
itre; Modern Cardiac and Vascular Remedies;
seases of the Liver; Disorders of Metabolism.—
ot. 24th: Diseases of Internal Secretion; Tuber-
osis of the Lungs; Heart Disease; Intestinal
seases.—Sept. 25th: Distinction Between Obstetric
lications in the Clinic and in Private Practice;
Possibility of Restoration of Function by Operation
Gynæcology; "Hormone-therapy" in Gynæcology
l Obstetrics; Causes of Danger to the Child During
egnancy and Birth; the Relation of the Special
ise-Organs with the Genital Organs in the Female.—
ot. 26th: Indications for and Success of Radio-
rapy in Gynæcology; New Methods of Examination
Gynæcology and Obstetrics; Metritis, Endometritis,
l Uterine Disorders; Gonorrhœa of the Uterus;
ology for the Practitioner; Tubal Pregnancy;
layed After-birth.—Sept. 27th: Modern Treatment
Syphilis; Treatment of Eczema; Radiotherapy;
xual Offences.—Sept. 28th: Indications for Urgent
eration; Surgical Indications in Diseases of the
iary Tract; Surgery of Accidents; Surgery of the
mmary Glands.—Sept. 29th: Ætiology and
agnosis of Intestinal Cancer; Treatment of Frac-
es by Simple Means. A Clinical Course will follow
m Oct. 1st to 6th. Those intending to take the
st-graduate course should send name, address, and
le to Dr. Kronfeld, Porzellangasse 22, Vienna. Fee
Austrians and Germans, 25.000 kroner; for
lgarians, Jugo-Slavs, Poles, Russians, Czecho-
ovaks, and Hungarians, 100,000 kroner; for other
eigners, 200,000 kroner. Other courses, beginning
July 2nd, August 1st, or Sept. 3rd, will be held
the following subjects: (1) Anatomy, Medical
emistry, Physiology, History of Medicine; (2)
rensic Medicine; (3) Internal Medicine; (4) Diseases
Children; (5) Neurology and Psychiatry; (6) Surgery
l Orthopædics; (7) Rhino-laryngology; (8) Ophthal-
ology; (9) Otology; (10) Gynæcology and Obstetrics;
) Skin and Venereal Diseases; (12) Urology;
) Radiology.

une 29th.

UNITED STATES OF AMERICA.

(From an Occasional Correspondent.)

Death of Dr. Hermann Biggs.

Dr. Biggs became ill on June 2nd in his holiday
np at Little Moose in the Adirondacks. Returning
his home in New York, the State health commissioner
ver rallied and died on June 28th. The diagnosis
broncho-pneumonia was confirmed by autopsy,
Dr. Biggs had particularly requested his friend,
of. Ewing, of Cornell University to perform this
vice. Hermann Michael Biggs was born in Trumans-
rg, N.Y., on Sept. 29th, 1859. After graduating
B. Cornell in 1882 and M.D. Bellevue Hospital
dical College in 1883, he studied in Berlin and
iefswald. In 1895 he directed the production of
first diphtheria antitoxin in this country. He
s been director of the Rockefeller Institute of
dical Research since its organisation in 1901.
1900 he became general medical officer of the New
rk city health department, with which he had
en been connected for 12 years. He was instru-
ntal in establishing the New York City bacterio-
ical laboratory, the first municipal bacteriological
oratory in the world, and quickly made a reputation
one of America's leading bacteriologists. He
nained with the city health department until 1914.
e mortality statistics in New York City under-
nt a rather startling change during his administra-
n, the general death-rate falling from 18·6 per
00 in 1902 to 13·78 in 1913. The corresponding
tes for the State of New York were 14·4 per 1000 and 15·4 per 1000 respectively. During this period he was largely responsible for formulating and directing the campaign against tuberculosis in New York that was so warmly commended by Koch in 1908, and that has been so successful. In January, 1914, Dr. Biggs was appointed Commissioner of Health to New York State—a post which he had three times previously declined. In this position, as in his former post with the city, Dr. Biggs was not only responsible for a great body of wise legislation, but he showed a wide constructive imagination in his work of popular education. During the war he was a member of the Relief Commission of the Rockefeller Foundation, he attended the international conference at Cannes, which gave rise to the League of Red Cross Societies, and subsequently was, for a short time, medical director of the League. Both the conference and the League secretariat profited greatly from his unusual executive ability.

His life was filled with fruitful and unselfish endeavour—we have listed above only a part of the distinguished services which he gave to his country and to the world. There is no doubt he might have made a fortune by the private practice of his profession. He preferred to spend himself in a cause which even in America is not well-paid, but which, thanks to the fine example of such pioneers as he, is yearly absorbing more and more of the finest minds in medicine.

American Medical Association Convention.

Signs are not wanting that the whole body of the profession is looking more and more towards methods of early diagnosis and prophylactic treatment. Thus the opening address to the A.M.A. Convention, held this year at San Francisco, brought strongly to the attention of delegates that the objects of the Association are to promote not only "the science and art of medicine" but also "the betterment of public health." Dr. R. L. Wilbur, of Stanford University, the president-elect, reminds us that we "can make our particular civilisation secure only by developing and controlling our food-supply and housing, holding aloof our enemies, particularly the microscopic ones, keeping up proper physical standards of individual and group health, and having ideals of service and religion that make life coöperative and wholesome." But while modern civilisation calls for public health legislation and the health supervision of industry, the individuality of the physician must be conserved. "The voluntary association of two men, one giving and one seeking relief, is at the heart of the art of medicine."

The chairman of the Council on Health and Public Instruction announced that a subscription list of 12,800 has already been secured for *Hygeia*, and judging by the high standard which this journal is maintaining—the July number contains an admirable article by Dr. Victor C. Vaughan on Small-pox Before and After Jenner—this circulation must certainly increase.

June 29th.

The Services.

ROYAL ARMY MEDICAL CORPS.

Lt.-Col. J. G. Gill retires on ret. pay.

Maj. E. V. Aylen to be Lt.-Col. to complete estabt.

TERRITORIAL ARMY.

General Hospitals: Maj. A. G. Gibson relinquishes his commn. and retains the rank of Maj.

Capt. J. W. Stretton relinquishes his commn. and retains the rank of Capt.

General List: Capt. T. D. Webster resigns his commn. and retains the rank of Capt.

J. D. M. Cardell to be Lt.

TERRITORIAL DECORATION.

The King has conferred the Territorial Decoration upon Lt.-Col. (Bt. Col.) A. B. Gemmel (retd.), Majs. A. B. Murray and H. M. Fort, Capt. E. P. Minett (ret.), and Capt. and Qr.-Mr. N. Greenwood.

SMALL-POX IN GLOUCESTER.

STATEMENT BY THE MINISTRY OF HEALTH.

IN view of the public attention attracted by the outbreak of small-pox at Gloucester, the Ministry of Health has issued a statement to the following effect.

Origin of the Outbreak.

The outbreak at Gloucester was not dealt with as soon as it might have been, because of the refusal of the local medical officer of health to admit the presence of small-pox on a large scale in the city. There were, however, admitted cases of small-pox as early as April, and he was advised of the danger by the Ministry of Health early in May on cases of small-pox occurring at places as distant from Gloucester as Liverpool and Abertillery, the source of infection in which was traced to Gloucester. At the end of May, a medical officer of the Ministry of Health, present in Gloucester on a public inquiry, visited various suspected cases reported to him by medical practitioners which he diagnosed as small-pox. The medical officer of health did not agree and Dr. A. F. Cameron, medical superintendent of the M.A.B. Small-pox Hospital at Dartford, was then invited to the city and agreed with the diagnosis of the medical officer of the Ministry of Health. A subsequent house-to-house visitation by officers of the Ministry of Health established the existence of epidemic conditions beyond dispute. The local authority dealt with the situation by entrusting charge of it to Dr. W. H. Davison, senior assistant medical officer of health, Birmingham. A special hospital was set up, special vaccination stations were established, and all contacts were traced as far as possible in view of the time which had been allowed to elapse. While fresh cases are still occurring, the situation is fairly in hand, though there is urgent need of vaccination of the population.

The Present Distribution of Cases.

The table (the figures in which are subject to revision) shows the number of cases of small-pox reported during each of the four weeks ended June 9th to June 30th in the various sanitary distric of the country.

District.	Week ended June—			
	9th.	16th.	23rd.	30th.
Basford R.D.	3	—	—	—
Bentley-with-Arksey U.D. ..	—	5	2	1
Heanor U.D.	5	1	4	—
Doncaster Boro'	—	2	—	—
Middlesbrough C.B.	2	—	1	—
Nottingham C.B.	1	—	—	2
Alfreton U.D.	—	—	1	1
Stockton-on-Tees Boro'	4	—	1	—
Clowne R.D.	1	—	1	—
Doncaster R.D.	2	4	10	1
Stapleford R.D.	—	5	—	—
Hereford City	—	—	1	—
Long Eaton U.D.	—	—	5	2
Cheltenham Boro'..	1	—	1	—
West Bromwich C.B.	—	—	—	1
Gloucester C.B.	27	51	78	90
Dursley R.D.	—	—	—	1
Gloucester R.D.	—	3	3	—
East Dean and United Parishes R.D.	1	—	4	3
Stroud, R.D.	5	1	—	1
Cirencester U.D.	1	—	—	—
Stroud U.D.	1	—	2	—
Westbury-on-Severn U.D. ..	—	—	1	—
Cardiff C.B.	5	—	—	1
Lydney R.D.	1	—	—	—
Wheatenhurst R.D.	—	2	—	1
Risca U.D.	—	1	1	—
West Ham C.B.	—	2	—	—
Martley R.D.	—	—	1	—
Warsop U.D.	—	—	15	2
Belper U.D.	—	—	1	—
Birmingham C.B.	—	—	1	2
Kirkby-in-Ashfield U.D.	—	—	6	11
Millom U.D. (suspected)	—	—	—	2
Rhondda U.D.	—	—	—	7
Smethwick C.B.	—	—	—	1
Port of London	—	—	—	1
	60	77	140	131

R.D., Rural District. U.D., Urban District.
C.B., County Borough.

It will be seen that the total number of notificatio for these four weeks is 408—as compared with 151 January, 154 in February, 214 in March, 141 in Apr and 112 in May.

Help in Diagnosis.

The particulars given as to the outbreak Gloucester indicate the dangers of incorrect diagnos It is the duty of the general practitioner to noti small-pox to the medical officer of health, and if he is doubt as to diagnosis he consults that officer. If his turn the latter has any doubt, he applies to t Ministry of Health and the medical staff of t Ministry at once assists him by advice on the spot to diagnosis and as to the action which should taken to stamp out infection locally and prevent i spreading. In view of the number of calls now bei made on the Ministry and the limited staff availab arrangements have been made by which medic officers of health, especially expert in small-pox, a ready to give immediate help as required in each 12 districts into which the country has been divided f this purpose.

Vaccination in Relation to Further Spread.

The statistics show that the incidence of small-pox present is very widely spread over the country. T number of notifications in the first six months of t present year is largely in excess of the notifications f the whole of last year, and is out of all comparison wi the experience recorded since the last epidemic perio 1902–04. In view of the extent to which vaccinati of infants has ceased (the percentage of vaccinatio for the whole country in 1921 being 38·3 per cent. births, as compared with 70·9 per cent. in 1907 and in view of the rarity of revaccination among t adult civil population, the Ministry of Health rega the situation with concern and hold the view that the is distinct risk of an outbreak of a serious characte The only practical remedy, now that the infection h been introduced, is increased recourse to vaccinatio and the Ministry of Health would urge that th remedy should be made use of as widely as possibl Vaccination can be obtained free of cost by referen to the public vaccinator in the area, who uses lym of approved quality supplied by the Governme Lymph Establishment at Hendon. The reserve tubes at Hendon is well over a million at present, a can be expanded as required.

MANCHESTER: CARE OF THE BLIND IN THE HOMES.—At the annual meeting of the Manchester a Salford Blind Aid Society held at Manchester on July 5t Mr. E. D. Macgregor, of the Ministry of Health, and oth speakers paid a tribute to the society's good work in the ca of the blind in their homes. Founded in 1900, the socie now accommodates 20 blind men and 20 blind women at t Memorial Home of Rest in Southport, and also gives a holid there to about 400 blind persons each year; at another hon 30 homeless blind women are provided for, and at a thi home are 30 more blind of both sexes. According to t latest returns some 35,000 persons in England and Wal are blind within the definition of the Ministry of Health i.e., so blind as to be unable to perform any work for whi eyesight is essential, but it is possible that the actual numb is nearer 45,000. Of the 35,000 more than 55 per cent. a over 50 years of age, and approximately 50 per cent. a untrainable and unemployable, blindness in a considerab number of cases being accompanied by other physical mental defects arising generally from the same cause produced the blindness. Venereal disease is the large single contributory cause of blindness, and accounts f 25 per cent. of the cases. There is some reason for believi that the incidence of blindness is declining and it is clear th ophthalmia neonatorum is decreasing. Mr. Macgregor, outlining the organisation he conceived to be necessary f the blind in a city like Manchester, said that no city in t country was better placed for securing such an organisatio than Manchester. The Corporation of Manchester, sa Mr. Macgregor, had not so far as he knew yet spent one penn as an authority under the Blind Persons Act, and it w three years since that Act was passed, but there were sig of Manchester moving in the right direction in this work.

Public Health Services.

IE HISTORY OF PUBLIC HEALTH EFFORT IN MANCHESTER.

AN illuminating and suggestive chronicle of the tivities of Dr. James Niven, the late medical officer health, while in the service of the Manchester iblic Health Committee, since 1894, is given in a ently published manual,[1] which includes also an count of the work achieved by the committee in so r as Dr. Niven himself had any personal share in it. ie chronicle is that of an unfinished task. Dr. ven would like to see certain branches of public alth come under the medical officer of health as ördinating and directing head, notably first the ork of the cleansing department, which needs to be rected in subordination to the sanitary requirements the city, as interpreted by the city's adviser in iblic health matters. This is equally true with gard to the department which deals with unwhole-me foods. The control of infectious disease and the nitation of schools should similarly, according to r. Niven, be placed under control of the medical ficer of health, as they originally were, in the same nse as the control of tuberculosis is his responsibility. e believes that by far the most important influence hich has governed the improvement of the public alth in Manchester, apart from economic conditions, as been the removal of organic filth, whether within or ithout the habitations of the people. Probably the ext in importance has been the control of infectious sease. No less weighty in their effects have been the onomic advance of the town and the consequent minution of poverty, though it is not easy here to ace cause and effect. Much of the bad housing in anchester is inseparable from the removal of filth. nprovements of a positive character, such as the stitution of parks, the physical care and training of hildren, the provision of public baths and wash-ouses, have also contributed much to the health of ie city. The provision of an abundant and pure ater-supply and of a varied food-supply of good uality has also been a factor in health, and the part layed by education has not been small.

The annual health reports for the city of Manchester ate back to 1868, when Dr. John Leigh was appointed he first medical officer of health, and the city had an stimated population of 345,295. From 1832 until his period the annual death-rate remained at about 2 per 1000. In Dr. Leigh's report for 1869, he ecords that so numerous were the inhabited ellars in Manchester a few years ago that it might vell have been considered a city of cave-dwellers. Jnder the heading of infectious diseases many ractical suggestions are given. Noteworthy are the emarks on "overlooked cases" in scarlet fever, ne of the most potent causes of the spread of this lisease. Measles is regarded as peculiarly a disease of overty—that is, in so far as the death-rate is con-erned. Tuberculosis, on the other hand, is described s a poverty-making disease, and it is suggested that high percentage of the existing poverty is attributable o this cause. It may come as a surprise to many that he staff employed in 1921 in the public health depart-nent, under the medical officer of health reached a otal of 861; included in this total are 215 at Monsall ever Hospital and 186 engaged in tuberculosis work; ealth visitors account for 62, maternity and child velfare centres 40, and in the sanitary department 31 persons were employed.

In a final review of the work achieved during his enure of office Dr. Niven expresses gratitude for the onstant support given him by the medical profession, without which no public health service can be successful. On this cordial note does Dr. Niven bring to an end a survey of his stewardship as medical officer of health of the city of Manchester, a survey that may be read with profit by every medical officer of health in Great Britain and beyond.

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[1] Observations on the History of Public Health Effort in Manchester. By James Niven, M.A., M.B., LL.D. Published by the City of Manchester. John Heywood, Ltd. 1923. Pp. 230.

REPORTS OF MEDICAL OFFICERS OF HEALTH.

THE following are the principal health statistics of a group of boroughs of varying size for the year 1922:—

Name of borough.	Estimated population (mid-year).	Birth-rate.	Death-rates per 1000 of population.				Death-rates per 1000 births.		
			All causes.	Tuberculosis.	Cancer.	Respiratory with influenza.	Infant mortality		Maternal mort. in childbirth.
							Legit.	Illegit.	
Halifax C.B. ..	100,500	15·9	14·9	1·1	—	—	112	75	6·2
Warrington C.B.	79,150	22·6	12·1	1·7	0·9	3·2	70	175	2·8
West Bromwich C.B.	76,260	24·1	14·1	0·9	0·8	4·6	86	141	5·5
Guildford B. ..	24,950	17·0	11·6	0·8*	1·4	2·7	40	111	0·0
Leamington B...	28,740	18·0	13·9	1·1	1·3	2·3	58	55	11·6
Shrewsbury B. .	31,240	19·5	13·3	1·5	1·6	3·3	43	138	3·3
Watford B. ..	46,610	19·0	9·6	1·0	0·9	2·3	55	100	3·3
Yeovil B.	15,280	17·6	10·4	1·0	1·6	2·0	53	333	3·7

C.B. = County borough. B. = Borough.
* Pulmonary tuberculosis only.

Halifax.

Dr. Cyril Banks, in reviewing the records of Halifax, points out that the general death-rate and infantile mortality rates are not good, and that the record of deaths of mothers in childbirth for 1920 and 1921 is a sad one. Although infantile mortality has shown a great drop in the last 30 years, there is no decline in neo-natal deaths, and the ante-natal clinic is not yet a success. Dr. Banks unhesitatingly condemns the Goux pail conservancy system, which is still the system in most general use for dealing with human excreta. An effort is being made to do away with tips and to adopt an up-to-date method for dealing with household refuse. An effort is also being made to deal with smoke abatement more effectively, and lectures have been arranged for stokers. A movement has been made towards the avoidance of overlapping (coördination) by employing the health visitors to visit tuberculosis cases. Apparently there is an idea prevalent in Halifax that an untrained woman may conduct the delivery of a midwifery case where a doctor has been engaged. Amongst other needs mentioned by Dr. Banks are properly constructed scarlet-fever wards, and improvements to the public slaughter-house.

Warrington.

Dr. G. W. N. Joseph mentions that, in these days, when economy is so necessary, there is room for a great advance without much expenditure by educating the people in the principles governing health. Housing is still the urgent question; 37 municipal houses were completed during the year, and 36 more were nearly completed. The points considered in allocating municipal houses are overcrowding, expectant mothers, occupation of bedrooms by adults of opposite sexes, husbands forced to live apart from their wives, and tuberculosis. There are still 673 overcrowded applicants on the waiting list. There are also 602 applicants not overcrowded, and 134 who live outside but mostly work in the borough. There is much profiteering among those who let lodgings, so that the lodgers are "taken in" in a double sense. "Unfit" houses cannot be closed.

The following are weekly rents of some of the new houses, including rates :—

	s.	d.
Wooden huts with two bedrooms	10	7
,, ,, ,, two smaller bedrooms	7	11
Concrete houses (Dorman Long system) with sitting-room, three bedrooms, bath-room..	16	3
Brick houses (Type B—Parlour and three bedrooms and bathroom)	16	3
Brick houses (Type A—Three bedrooms and bathroom)..	15	7

West Bromwich.

Dr. R. Woolsey Stocks reports that the sanitary inspectors have done a lot of hard work to improve the "appalling" condition of many of the dwellings. More new houses are urgently required, not only to replace those unfit for human habitation, but to enable those people at present living under conditions of dangerous and degrading overcrowding to find adequate accommodation. Diphtheria was prevalent and the case fatality was over 20 per cent. The doctor was often not called in early enough, owing to unemployment, to enable antitoxin to be used effectively. Dr. Stocks also thinks resistance was lessened owing to underfeeding, due to unemployment. On the other hand, it is satisfactory to learn from the school report that there was a marked decline in the number of cases of malnutrition, attributed to the satisfactory arrangements made for feeding the school-children and for the relief of distress. Dr. Stocks points out the need for a V.D. centre at West Bromwich. Although railway fares are paid to Birmingham on application, this system interferes with secrecy, and is not utilised by patients. Dr. Stocks draws special attention to the increase in maternal mortality in childbirth, due to an increase in puerperal sepsis. Dental work in the schools is having an effect: 61·5 per cent. of the routine inspected school-children were referred for dental treatment in 1922, as compared with 71·8 per cent. in 1921. A trained masseuse is employed to administer remedial exercises, and the two supervisors of physical education are actively at work.

Guildford.

Dr. R. W. C. Pierce reports that smoke abatement is being taken up in earnest. The Corporation electricity works, which was previously the worst offender in the town, now boasts a smokeless chimney owing to the installation of mechanical stokers. The dental clinic for mothers and children under 5 is doing good work; 25 mothers were fitted with dentures during the year. The Council pay a subsidy of £100 a year to the Queen's Jubilee Nursing Association to enable them to maintain a fourth midwife for the district.

Leamington Spa.

Dr. W. L. Goldie estimates that 65 per cent. of the population under 14 are absolutely unprotected in the event of an outbreak of small-pox. Expectant mothers are visited at home, but rarely come to the clinic, so that the new midwifery does not make much progress. The housing shortage continues. The local estimate made in 1919 of the need for 529 new houses was, Dr. Goldie thinks, an underestimate: 166 houses have been built under the municipal scheme. The comparatively high but "utterly uneconomic" rentals of the new houses lead to sub-letting and overcrowding. Insanitary houses have to remain occupied.

Shrewsbury.

Dr. H. Gordon Smith thinks the most satisfactory work of his department has been in connexion with maternity and child welfare. Although climatic conditions favoured a low infantile mortality rate in 1922, "with hopes of better housing even more striking results may ensue." The references to housing do not hold out much hope, however. The municipal schemes have not touched the poorly paid worker, and Dr. Smith says "many of the inhabitants never sleep in a bed, or if they do they share it with several adults or children." He further suggests that some of the large firms might provide a few houses for their own employees and help "to remove a blot o which no Salopian can feel proud."

Watford.

Dr. William J. Cox reports that the housing questio is the most urgent matter affecting the public health The health visitors meet with many cases of over crowding, although 1000 houses have been provided Dr. Cox thinks 2000 more are required if slums are t be demolished. Of six unhealthy areas scheduled, i is hoped that one will be dealt with before long. Ther are still 1800 unsatisfied applicants for houses, exclud ing non-residents. The maternity and child welfar scheme will be fairly complete when the propose dental clinic has been provided. Dr. Cox is impresse with the absence of malnutrition among the Watfor school-children, and also with their cleanliness. Owin to tactful following-up by the school nurses, a ver high percentage of treatment of defects is secured.

Yeovil.

Dr. Charles W. Gee says there are many cases o overcrowding, and that, owing to house shortage, n steps can be taken. The staple industry of Yeovi is the manufacture of leather gloves, which afford both factory and home employment. One of th gloving firms has installed hot baths, of which 95 pe cent. of the employees take advantage. The insuffi ciency of the water-supply is to be met by sinking a well into the greensand at Cattistock, in Dorset. Dr Gee says an open-air school is badly needed in Yeovi to deal with cases of pre-tuberculous, anæmic, and debilitated children, and that in the meantim playground classes should be utilised. At least tw half-days per week are needed for dental work in th schools, instead of one as at present.

SCHOOL MEDICAL SERVICE.

Birmingham.

Birmingham is invariably ahead in social effort. There are two nursery schools in the city, one in Tiverton-road with accommodation for 35 children, and another in Summer-lane with an average attendance of 40 out of a school roll of 49. The school medical officer, Dr. G. A. Auden, himself visits the school weekly, seeing any new admissions or cases requiring medical examination. A routine examination is made twice yearly of all the children. Dental examination and treatment are provided. The school has been singularly free from infectious disease, and the parents in the district are so anxious to obtain admittance for their children that selections have to be made on a necessity basis. It is to be hoped that special efforts will be made in Birmingham to increase the nursery school accommodation, if only to demonstrate the exceptional value of these schools. A new development has marked the past year. A consulting aural surgeon has been appointed to deal with the serious problem of discharging ears and deafness, and an aural clinic for this purpose has been opened in Great Charles-street for referred cases—that is, cases which have proved refractory in progress under treatment by the assistant medical officers, or which may require operative treatment or special education in a deaf school. Fifty children were examined in this connexion during the six months the arrangement has been in operation, and a large number were found to require operative treatment for enlarged tonsils and adenoids. Cases where the ear discharge, although secondary to naso-pharyngeal infection, has been due not to the presence of adenoids but to that of polypi in the maxillary antrum have been found to be more common in children than was expected. Verminous conditions have improved, the numbers infected being 1000 less than last year. Ringworm was found in 411 cases, which were all X rayed. The school dentists inspected 52,190 children, and referred 71 per cent. for treatment. In order to determine what results can be obtained by intensive methods a school was selected and the whole school was instructed dental hygiene by special lectures and lessons. The ntist and dental nurse then visited the school, and its were paid to the homes of those refusing treat-nt. The scheme is still in progress; 457 children ve been examined, and 426 found requiring treat-nt. Of these, 240 were treated, and 186 refused atment; 19 of the latter eventually received atment.

In addition to the Uffculme Day Open-air School, ere from May to September arrangements are de for 16 boys to sleep at the school, Birmingham w has at Cropwood a residential open-air school 52 children, presented fully-equipped to the city Mr. and Mrs. Barrow Cadbury, who have generously ered £1000 per annum towards the expenses. ery two years boys and girls will replace one another. is hoped that each child will remain at the open- school for six months, when he will then be nsferred, if possible, for a short period to Cropwood harden off. Dr. Auden is anxious to have further ovision for children with rheumatism and carditis, d in this direction he considers the most profitable pansion of special school work can be made. together 73,832 children were examined, 42,398 of ese requiring actual treatment or further observa-n. Of the 45,105 children examined at routine spection, 14,371 required treatment, and during the ar 18,507 children received it. There were 838 ses of malnutrition found at routine inspection, 46 cases of skin disease, 228 of defective speech, 6 with deformities, 21 cases of definite pulmonary d 116 of non-pulmonary tuberculosis. No children re recorded as having enlarged non-tuberculous rvical glands.

Obituary.

ATRICK WHYTE RATTRAY, M.B., C.M. ABERD., F.R.C.S. ENG.

Dr. P. W. Rattray, of Pemberton-gardens, Upper olloway, London, who died of angina pectoris on ly 2nd, in his sixty-fourth year, received his medical ucation at the University of Aberdeen, where he aduated in arts (first-class honours and gold medal) 1881, and in medicine (highest honours) in 1885, and the London and Middlesex Hospitals. He was for time senior demonstrator of anatomy at Aberdeen, d enjoyed a high reputation as a teacher. Being successful in one or two attempts to secure teaching d hospital appointments he turned to private actice, which he cultivated with great success. He came F.R.C.S. Eng. in 1888.

Dr. Alexander Blackhall-Morison writes: "Some ars ago I invited a well-known Aberdonian to dinner, d remarked that I had also asked one of the ost distinguished graduates Aberdeen ever sent out meet him, who was living contentedly in general actice. He at once inquired, 'Do you mean Pat ttray?' When invited to confer with Rattray always regarded it as a compliment, for cases in ich he sought counsel were invariably difficult. ttray shunned publicity; he wrote nothing, which to be regretted, for the studies of one with his calm dgment and comprehensive outlook would have en valuable. He leaves a widow, a son, who did od work in the Naval Flying Corps during the war, daughter, and warm friends to mourn their loss."

Another medical friend writes: "Rattray was the ul of honour; in practice he was the embodiment sagacity and precise knowledge, and these qualities re extended to his conversation and culture nerally. Ideally happy in his home life, he met ath as he had lived, with no complaint and no patience, and with a whispered apology for bringing colleague from his bed."

DONATIONS AND BEQUESTS.—The late Mr. James ith, of Blundellsands, Lancashire, left by will among other quests £5000, and £15,000 on the death of his wife, to the iversity of Liverpool for Scholarships.

Correspondence.

"Audi alteram partem."

THE PANEL PRACTITIONER'S RIGHT OF APPEAL.

To the Editor of THE LANCET.

SIR,—The pretentious claim of the Insurance Acts Committee of the British Medical Association to be regarded as the custodian of the interests of the panel practitioner during the present negotiations respecting the new agreement for service cannot be allowed to go unchallenged. At page 8 of a memorandum issued by the Insurance Acts Committee, it is stated that the production of the Draft Regulations, 1920, was the result of the continuous consultation of the Insurance Acts Committee by the Insurance Commissioners and the Ministry during the previous 18 months. At page 4 of this memorandum, under the heading "New Agreement for Service," is set forth a resolution passed by the Conference of Local Medical and Panel Committees as follows:—

> "That in the opinion of this Conference no medical practitioner should be deprived of the right to continue in insurance practice without a final right of appeal to an independent judicial administrative body or court other than His Majesty's Insurance Commissioners or Ministry of Health."

Herein follows the comment of the Insurance Acts Committee: "Specific provision made (it was only implicit before) that in a case of hearing by the Ministry of representations against a practitioner the Ministry may and if directed by the Court shall state in the form of a special case any question of law arising (Reg. 32 (3)). Otherwise no change made."

A more grossly misleading statement it would be difficult to conceive. Article 32 (3) of the Medical Benefit Regulations, 1920, makes no provision—specific or otherwise—for a final right of appeal to the High Court in a case of a hearing by the Ministry of representations against a practitioner. By disingenuously detaching a portion of Article 32 (3) from its context the Insurance Acts Committee obtained the requisite colour for the misrepresentation which it desired to foist upon the unwary practitioner. Whilst the significant omission of Sections 7 and 19 of the Arbitration Act, 1889, from Part III. of the Fifth Schedule to the Regulations, which sets out the provisions of the Arbitration Act, 1889, which shall apply to an inquiry under Part VI. of the Regulations, is passed over in silence by the Committee.

I am, Sir, yours faithfully,

J. H. CLEMENTS.

Winkleigh, N. Devon, July 6th, 1923.

THE PROPHYLACTIC TREATMENT OF PUERPERAL SEPSIS.

To the Editor of THE LANCET.

SIR,—I should like to support all that Lady Barrett advises in her efforts to apply modern surgical technique to the practice of midwifery. The risks of infection at parturition are as great as of infection during operations. No surgeon would argue that because circumstances compelled him to operate under extremely bad conditions, he should therefore omit the ordinary routine by which the operation area is rendered aseptic as far as it is possible to do so. Insanitary surroundings call for greater not for less precautions.

At the British Hospital for Mothers and Babies, Woolwich, to which I am attached, a routine approaching in carefulness that laid down by Lady Barrett is taught to the midwives. As regards in-patients, shaving of the vulva is always done, followed by swabbing with lysol solution and again with perchloride. A perchloride swab is left between the labia, care is taken to shave round the rectum with the patient on her side after the front has been done. The vulva and perineum in all operative cases are painted with iodine before interference. On the district, shaving is not always done on account of the prejudice against it, but it is considered advisable and the keen midwives adopt the practice. At present we provide for each district case, two sterilised pads, and for stitch cases, gauze dressings. If an instrumental case is near enough to the hospital, we send out towels, overalls, pads, and the like. All our midwives are taught to make vaginal examinations in gloves and to deliver in gloves.

With regard to antenatal work, I strongly support Lady Barrett. I have had dental treatment carried out in numerous cases, both at Woolwich and at the Welfare Centre of the Women's League of Service at Hammersmith. Gas is always given for extractions, and I have never known any ill-result. We use every effort to train the midwife pupils to rely on abdominal examination and to avoid vaginal examinations in all cases where the size and position of the head suggest the possibility of a difficult delivery.

The importance of an anæsthetic in the second stage cannot be too strongly urged in order to get full control as the child is born, and to avoid tears and their sequelæ.—I am, Sir, yours faithfully,

Mary A. Blair, M.D., B.S. Lond.

Belgrave-road, S.W., July 6th, 1923.

PROTEIN IDIOSYNCRASY AND ASTHMA.

To the Editor of The Lancet.

Sir,—We have recently had under our care two cases of asthma which we think are of special interest. The first is a sufferer with ten years' history of frequent incapacitation, and the second a man who had his first attack on occupying the room vacated by the first. The suggestion of a connexion between these two events was increased by the discovery that the second man, L., had a positive cutaneous reaction to the protein, for which the first man, K., had received the antigen as a therapeutic measure. As briefly as possible we wish to record the salient features of both cases and the steps in our investigation into their possible relationship.

K. is a man of 29, who for nine years had attacks of asthma at intervals of about a month, with the exception of a period in the summer of 1920, when he enjoyed five months practically without symptoms. The attacks occurred during the night and from four to six nights in succession. They were frequently associated with taking cold ; they had appeared to follow the taking of certain fruits, and a psychical element in causation had been noted on an occasion when asthma immediately followed a gasp of admiration on seeing a challenge cup won by comrades. Relief invariably followed the administration of adrenalin, and two minutes after the injection of V $\frac{1}{1000}$ adrenalin solution, the vital capacity had been found to have increased from 300 c.cm. to 1750 c.cm. The bronchial catarrh associated with asthma was always a marked feature, and it usually persisted for several days after amelioration of the bronchial spasm. Severe attacks were associated with a febrile reaction and occasionally herpes of the lips.

In December, 1922, K.'s statement that he thought attacks were induced by taking apples led to an investigation of his protein susceptibility by means of cutaneous reaction. There was no reaction to group proteins for fruits, but there was a positive reaction to organism A. Respiratory tract (streptococcus, staphylococcus, pneumococcus and influenza bacillus). As symptoms and physical signs of simple respiratory infection had accompanied the asthma, K. was then given a series of doses of antigen prepared from this protein, commencing with a dose of five units on Jan. 31st, 1923, and ending with a dose of 1000 units on March 7th. There was a mild attack of asthma during this course, but since its completion there has been no return of bronchial spasm. K. had hitherto shared a room with a friend, A., but while the inoculations were in progress he was accommodated in a ward. On May 7th he returned to his room rejoicing in his newly acquired resistance, only to " catch a cold " and return to hospital on the 18th with a temperature of 101·4° F., respirations 36, and pulse 128. Bronchial spasm was this time not absent, but barely recognisable, while the bronchial catarrh element was severe. Moist sounds appeared in the lower lobes of both lungs, there was copious frothy sputum, and the attack ended as had done former attacks of asthma, normal health being regained on May 25th.

In the meantime, K.'s friend A. changed his quarters, an on May 30th K.'s old room was occupied by two men, L and G. On June 5th L. had the first attack of asthma of hi life. It was mild, but attacks on the succeeding nights wer worse, and on the morning of May 9th he was unable to g to work and sought medical aid. He was admitted t hospital with a typical and severe attack of asthma, whic quickly improved, and from which he had completel recovered on the 13th. After a week's interval, durin which time he had normal health, cutaneous reactions wer carried out and L. was found to have a slightly positiv reaction to organism A.

Our next step was to investigate the skin reactions of th room-mates of these two men—i.e., A. and G.—and in bot cases negative results were obtained. During June 18th, 19th and 20th, K. and L. were accommodated together in small side ward. On the evening of the 20th both me were discharged from hospital, and L. returned to the no suspected room, K. entering an adjoining room. On the nigh of June 22nd–23rd L. had an attack of asthma. This wa repeated on the 24th, and on the 25th he was again remove from the room. After June 25th K. and L. have been i close association without apparent ill-effect in either case.

We regret that an urgent demand for side-ward accommodation induced us to terminate the isolation of K. and L. after three days together. L.'s firs attack occurred six days after entering K.'s room and his second six days after meeting K. and three days after re-entering K.'s room. We are, however inclined to the opinion that his attacks occur rathe in the suspected room than in the presence of K Both patients have had symptoms and signs which in the past, have led to a diagnosis of pulmonary tuberculosis, but in neither case has the tubercle bacillus been found in the sputum. K. has had attacks in many places, but has always associated certain localities with severe attacks. As described above a psychical element has been recognised in his case but it must be noted in this connexion that, as a soldier, he was never prevented from entering or leaving the line by asthma.

The following questions now present themselves Is K. a carrier of micro-organisms producing a protein to which both he and L. are susceptible ? As the room is specially constructed and maintained for the reception of ex-sanatorium patients, it would seem hardly likely that infection could take place after a lapse o 12 days, during which time the room was unoccupied Are both K. and L. in constant presence of similar organisms but only liable to bronchial spasm under certain undiscovered conditions existing in this room ? These are questions which we hope to investigate, but we consider that the unusual and definite nature of the phenomena with which we have come in contact merit their early publication.

We wish to record our indebtedness to Dr. P. C Varrier-Jones for permission to publish the foregoing notes. We are, Sir, yours faithfully,

L. B. Stott,
B. R. A. Morton.

Papworth, Cambridgeshire, July 5th, 1923.

THE LYMPHOCYTOSIS OF INFECTION.

To the Editor of The Lancet.

Sir,—I suggest that Dr. H. L. Tidy and Dr. E. C. Daniel have, in your current issue, committed themselves to statements which are of a somewhat too comprehensive nature. They record their opinion that " glandular fever and the condition described as infective mononucleosis are identical," and further, that the conception of infective lymphocytosis is based on articles which " reveal no evidence for the statement . . . . . that sepsis is a rare but occasional cause of absolute lymphocytosis." I readily admit that some of the cases brought forward in support of this view were cases of glandular fever, which Dr. Tidy has done so much to establish in its true position as a clinical entity, and that others were cases of leukæmia—e.g., the case of Sanders. But a residuum of cases fails to fit in under either heading, and some of these cases are contained in those articles which are so unceremoniously dismissed.

Cabot has the credit of first calling attention to a ndition which he described under the heading, The Lymphocytosis of Infection." His first case s that of a septic infection of the finger followed by nphangitis and enlargement of axillary glands. e blood changes are not given in detail, but a tement from Cabot that there was " throughout a ll-marked, absolute and relative lymphocytosis " s more value than mere figures. Fever continued r " several weeks," but the patient recovered and s in good health 15 years later. This is not the cture of leukæmia, nor is it that of glandular fever. t Dr. Tidy says that " glandular fever and the ndition described as infective mononucleosis are ntical." There is a further aspect of the question ich may be considered—namely, that there exists infective myelocytosis—e.g., that recorded by mon[1]—which would appear to bear much the same lation to myelæmia as infective lymphocytosis does lymphæmia. There are good reasons for supposing at a hyperplasia of the hæmopoietic tissues, comrable to that of leukæmia in all but degree, may mplicate various septic conditions, and is further such frequent occurrence as to be typical in mumps early years of life) and in glandular fever.

But it may be doubted whether the recorded cases arrant any more sweeping assertion than this.

I am, Sir, yours faithfully,

Sevenoaks, Kent, July 6th, 1923. GORDON WARD.

TUBERCLE ANTIGENS.

To the Editor of THE LANCET.

SIR,—In your issue of June 30th you draw attention litorially to recent work of Dr. A. R. Jentzer and his llow-workers regarding the attack on the acid-fast at of the tubercle bacillus *in vivo*. These workers ject or use a proprietary preparation or compound of ts, lipoids, and waxes. Prof. G. Dreyer, as is well nown, removes the fatty and waxy capsule of the bercle bacillus *in vitro* by formalin-acetone. In th the methods centre on the waxy and fatty rotective coat. According to Dreyer, the removal of e acid-fast substances releases the protein antigen. his is thus more readily soluble in trypsin, and after jection is more effective in the production of various tibodies. On the other hand, according to Jentzer d his colleagues, it is claimed that their compound of tty and waxy substances " stimulate the tissues to roduce ferments which not only saponify the fatty d waxy substances introduced by parenteral jection, but also the fatty, lipoid, and waxy constituents of the tubercle bacillus." This method of ttacking tuberculosis is described as novel, and in a nse to some extent as anticipating the work of rof. Dreyer, but the exact composition and mode of anufacture of the compound of the fats, lipoids, and axy substances used by Jentzer and his colleagues are ot published. May I point out that the employment f the fats and lipoids and the theory therefrom onstructed is not novel? For many years various spects of the fat-splitting action of the pancreas has ccupied my attention. The results of my work, arried out in the physiological and bacteriological boratories, King's College, have been published in HE LANCET and elsewhere.[2] The main outcome of his work has been to show that a natural and increased roduction of lipase in the blood and tissues is an nportant factor in the protective mechanism of the ody. This is particularly the case in malignant isease, although I have pointed out that this lipolytic efensive response is not specific to cancer but is ommon to tuberculosis and other bacterial invasions. his I have expressed in identically the same terms as mployed by Jentzer and his colleagues. Lipase, oreover, lends itself naturally to attacking the fatty and lipoid coat of the tubercle bacillus *in vitro*. As long known, lecithin is split by lipase and accelerates also the activity of that enzyme *in vitro* and *in vivo*. In my experiments it was found that fatty acids are liberated by lipase from killed tubercle bacilli *in vitro*. In this way saponified extracts were prepared and indicated for therapeutic use. Preparations were made also by extracting tuberculous material with the usual fat and lipoid solvents, alcohol, ether, and chloroform successively, in a Soxhlet's apparatus in the usual way, and saponifying the extracted material or emulsifying. This method in the main differs essentially from that of Jentzer and his colleagues in that the *products* of the fats and lipoids of tubercle bacilli are used, together with protein and phosphate derivatives or constituents of the bacillus. The soaps themselves—e.g., sodium oleate, organic and inorganic phosphates, and proteins—have marked power in stimulating tissue lipolytic activity. Similar methods have been employed in dealing with the fats and lipoids of the cancer cell and tissues. The idea or principle underlying treatment by these extracts is stimulation of tissue lipolytic activity with destructive action on the fats and lipoids of the cancer cell, as in the case of tuberculosis, on the fats and lipoids of the tubercle bacillus.

I am, Sir, yours faithfully,

J. A. SHAW-MACKENZIE, M.D. Lond.

London, June 30th, 1923.

DELAY IN GIVING DIPHTHERIA ANTITOXIN.

To the Editor of THE LANCET.

SIR,—All medical officers of health will agree with Dr. F. F. Caiger that frequently in fatal cases valuable time is lost by the practitioner. In 17 fatal cases of diphtheria occurring in Brighton during 1921 and 1922 the time lost by the doctor failing to diagnose the condition is shown in the following table :—

Doctor saw child on ..	2nd	3rd	4th	5th	6th	7th	
Patient had antitoxin on	3rd 4th 5th 7th 15th —	3rd 3rd 3rd 4th 5th 5th	4th 4th — — — —	5th 6th — — — —	7th — — — — —	9th — — — — —	day of illness.

There is little doubt from a study of the table that the case mortality of diphtheria can be greatly reduced by prompt diagnosis and immediate removal of the patient to hospital. In Brighton probably one-third of the deaths could have been avoided; assuming the same conditions for the whole of England and Wales the annual loss due to lack of prompt diagnosis by the doctor is some 1800 lives. When one considers that diphtheria in the child is easy to diagnose, also that negative swab results give little help, the folly of awaiting swab results is apparent.

My own conclusions are: (1) It is the duty of general practitioners to acquaint themselves with the easily-grasped clinical signs of diphtheria and the duty of those controlling fever hospitals to give opportunity to the general practitioner to see typical cases of the disease; (2) it is doubtful if local authorities should accept swabs for the diagnosis of acute throat conditions in children.

I am, Sir, yours faithfully,

DUNCAN FORBES,

July 3rd, 1923. Medical Officer of Health, Brighton.

R.A.M.C. MEMORIAL IN DUBLIN.—On July 4th Sir John Goodwin, Director-General of the Army Medical Service, unveiled in St. Patrick's Cathedral, Dublin, a memorial to the officers and men of the Royal Army Medical Corps who fell in the late war. The memorial is a marble tablet, a replica of that erected some months ago in Westminster Abbey. There was a large attendance at the unveiling ceremony.

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[1] Amer. Jour. Med. Sci., 1907, cxxxiii., 389.

[2] Shaw-Mackenzie, J. A.: THE LANCET, 1919, ii., 825; rit. Med. Jour., 1921, i., 402; Jour. Trop. Med. and Hyg., 1921, xiv., 161; Med. Press and Circ., 1922, i., 287.

Medical News.

UNIVERSITY OF CAMBRIDGE.—At recent examinations the following candidates were successful :—

DIPLOMA IN MEDICAL RADIOLOGY AND ELECTROLOGY.

Part I., Physics and Electrotechnics.—Hubert O. Gunewardene, Richard Hayes, and Harold K. G. Hodgson.

Part II., Radiology and Electrology.—Narayan Mahadev Bodas, Lionel R. G. de Glanville, Malcolm Frizell, Hubert O. Gunewardene, William H. Hastings, Richard Hayes, Mahadev Dattatraya Joshi, Anna T. Kellock, Gabriel J. Luyt, Margaret J. Moir, Jessie F. Sheret, Sorab Byramji Warden, and Edward V. Whitby.

UNIVERSITY OF LIVERPOOL.—At examinations held recently the following candidates were successful :—

DEGREE OF M.D.

A. V. Campbell and S. M. A. Faruki.

DEGREES OF M.B. AND CH.B. (HONOURS).

Class I.—D. Macfarlane (distinction in Obstetrics and Surgery).

Class II.—F. Earlam and T. J. Kirkpatrick (distinction in Obstetrics), J. Roberts (distinction in Medicine), and A. Tumarkin (distinction in Surgery).

FINAL EXAMINATION FOR DEGREES OF M.B. AND CH.B.

Part III.—B. Abelman, A. R. D. Adams, J. Berkson, R. W. Brookfield, T. L. Bulmer, Hilda Cantrell, W. J. B. Chidlow, R. G. Cooke, V. C. Cornwall, I. H. Davies, Hilda M. Davis, J. O. Edwards, D. P. Finn, N. D. Fraser, J. R. Griffiths, S. Hesselberg, Elizabeth Hunt, T. Knowles, W. J. Laird, D. A. Levin, C. B. Lewis, Eileen M. Lloyd, Mary M. McMillan, P. Malpas, J. H. Moorhouse, Beatrice M. Niven, T. V. O'Brien, C. H. Owen, J. D. O'M. Poole, Gertrude E. Pugmire, E. L. Roberts, Dorothea W. Rogers, J. F. D. Shrewsbury, E. R. Smith, Helen Standring, Dorothy A. Taylor, H. A. Thomas, E. J. Whymark, H. P. Widdup, A. G. Wilkinson, E. B. Wilkinson, J. Williams, and Mary G. T. Williams.

Part II.—B. E. Acland (distinction in Public Health), M. M. F. Arthur, C. B. Bamford, P. D. Barling, E. C. Benn, R. V. Berrington, C. H. Bradley (distinction in Public Health), R. S. Brock, Helen S. H. Brown, Alison M. Brummitt, J. W. Cowen, N. Cresswell, M. M. Datnow, Edwina M. Davies, Eileen N. Deane, W. T. Donovan, W. H. Ellam, W. Emdin, E. A. R. Evans, F. R. Faux, H. W. Fell (distinction in Forensic Medicine and Toxicology and Public Health), H. R. Fisher, M. Fisher, C. G. Foxcroft, F. F. Fuller, G. A. Fulton, G. A. Garrett, J. Gaughan, H. Gobie, M. Godwin, J. Graham, T. A. Griffiths, Dorothy M. Hanson, T. Hare, A. D. Harper, F. C. S. Hinsbeeck, Fannie S. Holt, S. Howard, J. E. Howie, G. P. Huws, Bertha H. Irvine, F. P. Irvine, Elvy I. Johnstone, C. P. Jones, R. W. Jones (distinction in Forensic Medicine and Toxicology and Public Health), R. C. Jones, R. Jones (distinction in Forensic Medicine and Toxicology), D. Katz, G. F. Kinder, J. Leggate, W. E. Lishman, J. H. M. Little, G. Lowe, W. A. McCurdy, G. Macdonald (distinction in Forensic Medicine and Toxicology), Margaret S. Macdonald, E. Miles, D. H. Mills, E. P. Moloney, G. A. Moulden, A. Newton (distinction in Forensic Medicine and Toxicology), J. R. R. Nicholas, J. R. Oddy, J. J. O'Donovan, F. C. O'Mara, A. Oserovitz, E. R. S. Owen, R. D. Owens, A. Pool, R. J. Pryddérch, Gwendolen H. ff. Roberts, J. T. C. Roberts, E. Rowlands, E. Scott, J. A. Scott, P. Strelitz, G. V. L. Taylor, A. C. Terry-Thompson, J. H. Thompson (distinction in Public Health), J. J. du Toit (distinction in Forensic Medicine and Toxicology), Marjorie A. Unsworth, H. S. Welton (distinction in Forensic Medicine and Toxicology), T. W. White, and Gwennie Williams (distinction in Forensic Medicine and Toxicology).

Part I.—Mary G. B. Allen, C. G. Foxcroft, T. Hare, A. D. Harper, R. W. Jones (distinction in Pathology), T. S. L. Jones, Rebecca Katz, W. A. McCurdy, J. McWilliams, J. R. Mitchell, F. C. O'Mara, R. D. Owens, P. J. Rogers, J. H. Thompson, and Mabel J. Watterson.

DIPLOMA IN PUBLIC HEALTH.

Doris Brown, Matilda L. Craig, Jeannie P. Dunn T. K. Hughes, W. McMullen, and T. R. Roberton.

UNIVERSITY OF DUBLIN, SCHOOL OF PHYSIC, TRINITY COLLEGE.—At examinations held recently the following candidates were successful :—

FINAL MEDICAL EXAMINATION.

Part I., Materia Medica and Therapeutics; Medical Jurisprudence and Hygiene; Pathology and Bacteriology.—Thomas W. May (high marks), Paul H. N. Labuschagne (high marks), William C. Somerville-Large (high marks), Isidore Rosin, James Dick, William Gallaugher, James V. Morris, William B. Roantree, Eric T. S. Rudd, Oliver Chance, William P. E. McIntyre, Thomas G. B. Crawford, William A. Hopkins, Joseph R. Gregory, and O'Donel T. D. Browne.

Part II., Medicine.—Marjorie F. Sibthorpe (high marks), Victor O. McCormick (high marks), Paul J. Grobler, Morris Cohen, Benjamin W. D. Fayle, Francis J. O'Meara, Charles T. MacCarthy, William T. Hogan, William E. Hutchinson, Mossy Jaffe, James E. Deale, Frederick T. Easby, Richard A. D. Pope, William L. Duncan, Isobel G. Smith, Henry M. Martin, Harry Ruben, Harold Lewin, Reginald A. Dench, Richard C. L. Griffiths, Martha Reid, Albert V. Foster, Cecil H. Keller, Solomon Narunsky, Bertha H. Lawler, James J. O'Grady, Frederick G. Brown, Henry W. L. Dale, and Isabella H. Speedy.

Surgery.—Robert T. Jackson (high marks), Benjamin W. D Fayle, Francis J. O'Meara, Joseph E. Eliason, Joseph A Gaynor, John M. Mounsey, Marjorie F. Sibthorpe, Richar A. D. Pope, Hyman S. Roseman, Maria E. Wagene Reginald A. Dench, William S. Dixon, Philipp F. H Wagner, Bernard Morris, William E. Hutchinson, Wilfri E. C. Wynne, Arthur Darlington, Asher Asherson, William Whaley, Gladys Weatherill, Frederick T. Easby, Dermo H. F. Milmo, Dorothy C. H. Dorman, Lazarus Heyman Alice M. A. Downing, Robert S. McElroy, Richard C. Griffiths, Henry L. Hanna, Rupert L. Hill, James R Wills, Siegfried D. Gabbe, Joseph C. Byrne, Eric C. Downer Willem J. Janse van Rensburg, Charles T. MacCarthy Solomon Narunsky, Pieter C. du Plessis, Charles Gordon Albert V. Foster, Tobias Freedman, Dorothy I. Henry Herbert Kohlberg, Israel Marin, Laurence Phillip Charles R. Hillis, Julius Kruger, Jack A. Levitt, and Joseph M. O'Connor.

Midwifery.—John J. Laing (high marks), Maynard A Gerrard (high marks), Henry Isaacson (high marks) James E. Deale, William F. Whaley, Rudolf Schaffer Robert F. J. Henry, William L. W. Smith, Noel G. McAuliffe Thomas G. Wilson, Gordon Purdy, Gerrard A. Sloan Wallace R. Aykroyd, Evaline E. Mooney, Lucy M. Joly James J. O'Grady, Isaac J. Isaacson, Mossy Jaffe, Charle Gordon, Kathleen D. Murison, Norman M. Greeves Philip P. van der Merwe, Jan Andreas du Toit, Isabella H Speedy, Jack M. Gordon, James J. FitzGerald, Willem J Janse van Rensburg, and Robert L. C. Fisher.

DIPLOMA IN PUBLIC HEALTH.

Part I., Chemistry, Bacteriology, Physics, and Meteorology.—Edmund C. Smith and Elizabeth Killian.

Part II., Sanitary Engineering, Practical Sanitary Report Hygiene and Epidemiology, Vital Statistics, and Publi Health Law.—Edmund C. Smith, Dorothy K. M. Henry Elizabeth Killian, and Catherine A. Goggin.

UNIVERSITY OF MANCHESTER.—The following appointments have been made :—Lecturer in Botany: Mr John Walton. Lecturer in Bacteriology: Dr. G. Selby Wilson. Assistant Lecturers in Chemistry: Mr. E. L. Hirs and Mr. G. N. Burkhardt.

THE LATE DR. G. L. H. REVILL.—George Leslie Howard Revill, who died on July 6th, received his medical education at Charing Cross Hospital and at Vienna, becoming M.R.C.S. in 1890. He was well-known in Lincolnshire, having a wide practice centred at Heighington, and being very popular alike with his patients and with the members of the many public bodies and friendly societies with whom he held appointments. He was a devout churchman and in politics an ardent Conservative, but he formed enduring friendships with many whose views differed widely from his own. His widow and a son survive him.

ROYAL SOCIETY OF MEDICINE: SECTION OF COMPARATIVE MEDICINE.—On July 6th, under most promising auspices, a new section of this society was formally constituted under the title of the Section of Comparative Medicine, the membership of which is open to duly qualified veterinary surgeons as well as to practitioners of human medicine. Considerable advance has already followed the coöperation of workers on the two sides of medicine, and it is hoped that the constant interchange of views at the meetings of this section will lead to even more rapid progress. The new section, the foundation of which is largely due to the good offices of Prof. F. T. G. Hobday, starts with a strong council, half representing human medicine and half veterinary medicine, with Sir Clifford Allbutt, who has for many years advocated the rapprochement which has now been accomplished, as president. Vice-presidents include Sir Layton Blenkinsop, Lieut.-Colonel J. W. Brittlebank, Sir William Hale-White, Prof. F. T. G. Hobday, Sir William Leishman, F.R.S., Sir John Moore, Sir Leonard Rogers, F.R.S., and Mr. G. H. Wooldridge. Meetings for papers and discussions will be held next session on the fourth Wednesday of each month at 5.30 P.M.

POSTPONEMENT OF THE INTERNATIONAL CONGRESS OF OPHTHALMOLOGY (1925).—The Committee of British Ophthalmologists, appointed to organise an international congress in 1925, finds with regret that it is unable to do so in accordance with the conditions under which the British invitation was accepted by the Washington Ophthalmological Congress in 1922. It will be remembered that at Washington it was decided that the next congress should be strictly international and that German should be one of the official languages. The Committee has since been informed that the Société Française d'Ophtalmologie, the Société d'Ophtalmologie de Paris, and the Société Belge d'Ophtalmologie have passed resolutions to the effect that they feel themselves unable to participate in a congress if Germans are invited. The Committee is of opinion that to proceed with the congress in these circumstances would tend to perpetuate a schism in the ranks of ophthalmology and militate permanently against the progress of the science which all desire to promote. The Committee has therefore reluctantly decided to postpone the congress.

MEDICAL SOCIETY FOR THE STUDY OF VENEREAL SEASES.—The annual general meeting of the society will held at 11, Chandos-street, Cavendish-square, London, . 1, on July 20th, at 5.30 P.M., when a paper will be read Mr. Frank Kidd on Vasostomy for Chronic Seminal esiculitis (A New Technique).

FELLOWSHIP OF MEDICINE.—A complete course of ctures on medical and surgical diseases of children will given by all the members of the staff at the Royal Waterloo ospital from July 16th to August 3rd. In addition to the cture-demonstrations candidates will have the privilege attending the out-patient department, wards, and operaons. A special course in dermatology will be given by embers of the staff at the Hospital for Diseases of the Skin, lackfriars, from July 16th to the 28th inclusive. Instrucon will be given in the out-patient department every ternoon from 2.30 P.M., and a special demonstration on teresting selected cases will be held at 4 P.M. on July 16th nd July 25th. The course will also include a venereal clinic Tuesday and Friday each week from 5.30 to 7 P.M. The es for these courses are 3 guineas and 2 guineas spectively. Application for copies of the syllabus and ckets of admission should be made to the Secretary to the ellowship of Medicine at 1, Wimpole-street, London, W. 1.

SIXTH CONGRESS OF THE SOCIÉTÉ INTERNATIONALE E CHIRURGIE.—The Congress will be held in London om July 17th to 20th ; the scientific sessions will be held the Royal Society of Medicine, 1, Wimpole-street, W. 1, nd the definitive programme is as follows :—July 16th : P.M., meeting of International Committee. 17th : 11 A.M., pening by the Prince of Wales, speeches by Lord Curzon, r. Neville Chamberlain, and others, and address by Sir illiam Macewen (president) ; 2 P.M., discussion : Surgery of ndocrine Glands (Thyroid excluded). 18th : 9.30 A.M., disussion : Arthroplasty ; 2 P.M., operations at hospitals. 19th : .30 A.M., discussion : Late Results of Peripheral Nerve njuries ; 11.30 A.M., general meeting ; 2 P.M., operations. 0th : 9.30 A.M., discussions : Vaccine and Serotherapy Tetanus excluded), and Operative Shock ; 2 P.M., operations ; emonstrations on vaccine-therapy by Sir Almroth Wright at t. Mary's Hospital. Entertainments :—July 16th : Evening eception by the University of London ; 17th : evening recepon by the President ; 18th : official luncheon by H.M. overnment for National Delegates ; evening reception by he Lord Mayor, Mansion House. 19th : 4–6 P.M., reception y the President of Royal College of Physicians ; 9–12 P.M., eception by President of Royal College of Surgeons ; 0th : Annual banquet of Society. Secretaries of the ongress, Sir D'Arcy Power and Mr. J. S. H. Roberts elegate for British Isles).

Mr. Henry Kimpton announces the publication of he following : "The Tonsils : Faucial, Lingual, and haryngeal, with some account of the Posterior and Lateral haryngeal Nodules," by Dr. Harry A. Barnes (second dition) ; "Practical Local Anæsthesia and its Surgical echnic," by Dr. Robert Emmett Farr ; "Cerebro-spinal luid in Health and in Disease," by Dr. Abraham Levinson, B.S. (second edition)' "Tonsillectomy by Means of the lveolar Eminence of the Mandible and a Guillotine," by Dr. Greenfield Sluder ; "Local Anæsthesia in Dental Surgery," by Mr. F. St. J. Steadman, L.D.S. Eng. ; "Epidemiology and Public Health : A Text and Reference Book for Physicians, Medical Students, and Health Workers," by Dr. Victor C. Vaughan (vol. ii. ready, ol. iii. in preparation) ; "Clinics and Collected Papers of St. Elizabeth's Hospital, Richmond, Virginia, 1922" ; and "Collected Papers from the Washington University School f Medicine, 1921."

CONDITION OF PRISONS AND INTERNMENT CAMPS N THE IRISH FREE STATE.—The Free State Government has ssued a copy of the report of the International Red Cross Commission on the treatment of prisoners in the hands of he Government. It is stated that the Free State Government welcomed an investigation by an independent and competent body, in view of the propaganda that had been conducted, alleging improper treatment of prisoners. Mr. R. Haccius, a delegate from the Red Cross Commission, visited the principal internment camps in the Free State. He stated that he found the treatment of the prisoners devoid of hostile spirit, and although the Government refused to grant the prisoners the status of "prisoners of war," in reality it treated them as such. Nowhere did he ind a wounded or sick prisoner left without medical treatment. On the contrary, he found everywhere a carefully organised medical service. The serious accusations made on this subject appeared to the delegate to be unfounded. He noted that the buildings of the old North Dublin Union were in course of alteration for the reception of the women detained at Kilmainham, and these buildings with the surrounding gardens would fulfil all desirable hygienic conditions. The delegate had instructions to exclude inquiry into individual complaints. He noted that searches had taken place in various private hospitals, but the working of these hospitals had not been interfered with. The complaints regarding sanitary conditions and food in the camps were unfounded. Mr. Haccius then gives a detailed report on the various camps and prisons visited. While satisfied generally with the sanitary conditions, he noted congestion in Mountjoy Prison, where there were in some cases three prisoners in cells which should not hold more than two. He speaks favourably of the medical arrangements everywhere, and noted at the Curragh Camp that "the patients seemed to be very grateful to the doctors for their devoted care and attention."

ROYAL VICTORIA HOSPITAL, BELFAST.—At a meeting of the board of management on July 4th the retirement of Prof. Thomas Sinclair after 38 years' service was the subject of several speeches expressive of the high esteem in which he is held, and of the appreciation by the board of his work as surgeon and teacher. An appropriate resolution was moved by Lieut.-Colonel Mitchell, seconded by the Rev. W. A. Watson, supported by Mr. W. Carson, J.P., and carried with much enthusiasm. The chairman of the board (Prof. J. A. Lindsay) described Prof. Sinclair as one of the pillars of the Royal Victoria Hospital and one of the mainstays of the Belfast Medical School, whose reputation at home and abroad he had done so much to promote and to enhance. Prof. Sinclair is succeeded on the staff by Mr. S. T. Irwin. Mr. H. P. Malcolm was elected assistant surgeon to the hospital.

AN ASYLUM IN INDIA.—The annual statements of the Central Provinces Lunatic Asylum naturally reveal a number of features which are strange to similar work in this country. The hospital accommodates about 400 insane, but the number had to be reduced considerably during the year owing to the scarcity of water. Mania and melancholia are the prevalent types of insanity ; no cases of general paralysis, and only one of mental disease attributable to syphilis, were admitted during the year. On the other hand, cannabis indica plays an ætiological part which is unfamiliar to us ; tuberculosis appears to be fairly common, and infection with ankylostomes was present in 16 per cent. of the admissions. A radical change in the diet scale has been introduced, and among other improvements which have been sanctioned by Government is the provision of proper accommodation for private patients.

UNIVERSITY COLLEGE, LONDON.—Viscount Chelmsford, chairman of the University College Committee, with Sir Gregory Foster, the Provost of University College, the Deans of the College Faculties, and the tutor to women students, held a reception last Saturday afternoon, July 7th, at which the whole of the College buildings were open for inspection. One object of the reception was to give all old students of University College an opportunity of re-visiting the College and of seeing some of the more recent extensions which have taken place, and in particular the new building for anatomy and the extension of the physiology and pharmacology buildings, forming the Rockefeller Benefaction, opened by the King on May 31st. University College Hospital and University College Hospital Medical School were open throughout the afternoon. About 3000 persons were present, including many headmasters and headmistresses of schools and others connected with various branches of education.

Sir Henry Gray, who is leaving Aberdeen to take up his new post as chief surgeon of the Royal Victoria Hospital, Montreal, was entertained by members of the medical profession to dinner at the Palace Hotel, Aberdeen, on June 27th, Mr. J. Scott Riddell in the chair. In proposing the health of the guest, Mr. Riddell spoke of other Aberdonians who had crossed the Atlantic to professorial chairs in Canada and the United States, and in the course of an eloquent tribute to Sir Henry Gray referred to him as one who would spread the light and enhance the reputation of the medical school of Aberdeen. Sir Henry Gray, in replying, recalled the commencement of his professional work under Sir Alexander Ogston, and his long association with many of those present. He spoke of his long consideration of the invitation to go to Montreal, and of the restlessness, increased by the war, which had helped him to come to his decision. In the light of the nature of his new work, of the environment in which it would be set, and the possibilities of the future in such a progressive place, he felt that it was one of the most desirable positions in the surgical world. Later on in the course of his reply Sir Henry Gray spoke of his great indebtedness to the nursing profession for the very high order of help he had received from them.

Parliamentary Intelligence.

HOUSE OF COMMONS.

WEDNESDAY, JULY 4TH.

Industrial Diseases.

Mr. D. G. SOMERVILLE asked the Minister of Labour whether, in view of the request for the inclusion of eyesight failure in the Workmen's Compensation Act, his department possessed any reliable record showing how the individual senses were affected by particular industries, and whether in such cases steps were taken to differentiate at any stage between failure due to advancing years and failure due to conditions of work.—Mr. LOCKER-LAMPSON (Under Secretary to the Home Office) replied : The department is in possession of a great deal of information as to diseases and affections which are caused by particular industries and processes, but so far as regards failure of eyesight, such as short-sightedness or other kinds of eye-strain, it would not be possible to differentiate between the effects of the conditions of work, advancing years, and other possible causes.

Viscount CURZON : Does the hon. gentleman's answer apply to the case of railwaymen disabled by injured eyesight ?—Mr. LOCKER-LAMPSON : As my noble and gallant friend knows, certain afflictions of the eye are already included under the Act of 1906 and they are being added to.

Skimmed Dried Milks.

Mr. HURD asked the Minister of Health the result of his consideration of regulations for the proper labelling of skimmed dried milks as unfit for children.—Mr. NEVILLE CHAMBERLAIN replied : Draft regulations dealing with this matter have been prepared in my department and I am causing them to be forwarded to the other departments concerned as a preliminary to discussion.

Mr. HURD : Is there any necessity in this matter to consult other countries seeing it is purely a domestic affair of our own ?—Mr. CHAMBERLAIN : So far as I am aware it will not be necessary.

Approved Societies and Voluntary Hospitals.

Sir EDWIN STOCKTON asked the Minister of Health whether, in view of the amount of disposable surpluses of approved societies under the National Health Insurance Act, he would consider the desirability of introducing legislation for the allocation of funds therefrom for the hospital maintenance of insured patients, seeing that such a policy would materially contribute towards meeting the total annual deficiency of the voluntary hospitals.—Mr. NEVILLE CHAMBERLAIN replied : It is open to any approved society having a disposable surplus on valuation to devote the whole or part of such surplus to making payments to hospitals or convalescent homes towards securing the maintenance and treatment therein of members of the society, and out of the surpluses on the first valuation a sum of £979,000 was set aside for this purpose by certain societies in England in respect of the period from July, 1921, to June, 1926. The selection of the additional benefits to be provided by a society for its members rests with the members themselves, and I do not think it desirable that legislation should be introduced to make it compulsory on every society having a disposable surplus to allocate the whole or part of the surplus to any particular additional benefit.

Mr. GERALD HURST asked the Minister of Health whether he was aware of the hardship caused by the disability which now debarred voluntary hospitals from sharing in surplus funds which had accumulated under the National Health Insurance Act, and that the Manchester Royal Infirmary spent about £70,000 a year in maintaining nearly 5000 persons insured under that Act without drawing any substantial contributions from their approved societies ; and if he would consider so amending the law that maintenance and treatment at voluntary hospitals might be included among the additional statutory benefits to be provided from disposable surplus funds.—Mr. NEVILLE CHAMBERLAIN replied : There is no such disability as is mentioned in the first part of my hon. friend's question, and the making of payments towards the cost of the maintenance and treatment of insured persons at voluntary hospitals is already included amongst the additional benefits which may be provided by approved societies from their disposable surplus funds. Such payments are, in fact, being made by a number of societies with a total membership of over 7,000,000 insured persons. The second part of the question does not therefore arise.

Poor-law Midwifery Fees.

Lieut.-Colonel FREMANTLE asked the Minister of Health if he was aware that Poor-law midwifery fees had not been revised since 1847 ; and whether he would take steps to bring them into line with the fees ruling at present for services of a similar nature.—Mr. NEVILLE CHAMBERLAIN replied : It is true that the Order of 1847 has not been revise but in a number of cases special arrangements between th guardians and their medical officers as regards midwifer fees have already been approved. I will, however, conside the question of the revision of this part of the order.

Patent Medicines Legislation.

Lieut.-Colonel FREMANTLE asked the Minister of Healt if it was proposed to introduce a Bill to give effect to th recommendations of the Select Committee on Paten Medicines, proposals for which were agreed with the partie concerned in 1920.—Mr. NEVILLE CHAMBERLAIN replied : I the present state of business the Government cannot undertake to introduce legislation on this subject during th present session.

Pasteurised Milk.

Mr. ADAMS asked the Minister of Health whether he wa aware that, owing to the Milk (Special Designations) Orde 1923, modifying previous orders regarding pasteurisation it was possible for milk to be sold to the public after havin been subjected to repeated heating processes, thus having th major portion of its nutritive value destroyed ; and whethe he would take the necessary steps to ensure that such reheate milk should not be retailed to the public or, if so retailed, it exact nature should be indicated.—Mr. NEVILLE CHAMBERLAIN replied : The answer to the first part of the question i in the negative. It is expressly provided in the Milk (Specia Designations) Order, 1923, that the milk sold as "Pasteurised" milk shall not be heated more than once. A regards the second part of the question, I am advised tha the danger arising to public health from the sale of reheate milk is not such as to justify the issue of special regulation which in present circumstances might result in restrictin the supply of milk.

Vaccination and Small-pox.

Dr. CHAPPLE asked the Minister of Health what was th proportion of vaccinated to unvaccinated children of th age of 10 years and under; whether there had been an progressive change in this proportion; and what steps h proposed to take in order to safeguard the population agains a possible epidemic of small-pox.—Mr. NEVILLE CHAMBERLAI replied : It is not possible to state definitely what proportio of the children now living of the age of 10 years and unde has been vaccinated. The available statistics show th numbers of children born in each year who were vaccinate within a period expiring at the end of the year following th year of birth. These statistics suggest that the proportio of children now living of the age of 10 years and unde who have been vaccinated is not more than 50 per cent I will send the hon. Member a statement giving the figure for each of the years 1912 to 1921, and showing that th proportion of vaccinations to births has fallen from 50·1 pe cent. in 1912 to 38·3 per cent. in 1921. As regards the las part of the question, my department has recently circulate to sanitary authorities and boards of guardians memorand as to the steps which should be taken on the occurrence o small-pox, and all possible assistance is rendered by medica officers of my department to the authorities of those district in which an outbreak occurs.

Mr. TREVELYAN THOMSON asked the Minister of Healt the average percentage of vaccinations to total births fo the last five decennial periods and the number of cases o small-pox per 1000 of the population for the same periods.—Mr. NEVILLE CHAMBERLAIN replied : As regards the firs part of the question the percentages of vaccinations to tota births in the periods referred to were as follows : 1872–1881 85·6 ; 1882–1891, 82·2 ; 1892–1901, 68·0 ; 1902–1911, 67·9 1912–1921, 43·4. As regards the second part, particulars a to the total number of cases of small-pox in England and Wales are not available for any year prior to 1911. Th number of cases per 1000 of the population for the period 1912–1921 was 0·004.

Replying to Mr. HURD, Mr. CHAMBERLAIN said that he wa keeping a close watch upon the situation, and so far as h could see at present there was no need for special legislation

Mr. THOMSON : Has the right hon. gentleman any information which shows whether the percentage of cases of small-po has increased relatively to the decrease in the number o vaccinations ?—Mr. CHAMBERLAIN : Yes, undoubtedly.

Viscount CURZON : Has the right hon. gentleman an explanation with regard to the very remarkable drop in th last set of figures which he gave from 67 per cent. to 43 pe cent.?—Mr. CHAMBERLAIN : I think that is due to the agitation against vaccination which has taken place in various parts of the country.

Mr. FRANK GRAY asked the Minister of Health whether he had any information indicating that a large number of cases at Gloucester had been wrongly diagnosed by officials of his department, and whether he proposed to take any steps in the matter.—Mr. NEVILLE CHAMBERLAIN replied : The answer to the first part of the question is in the negative, and the second part therefore does not arise.

Ir. **SNOWDEN** asked the Secretary of State for the Home)artment whether his attention had been called to the iculties put in the way of parents wishing to take advantage the Vaccination Act, 1907, by magistrates who disap- ved of exemption being granted to objectors to vaccina- ı ; and whether he would inform all magistrates sitting in n court that they must accept statutory declarations under t Act, whatever their views in respect of vaccination.— LOCKER-LAMPSON replied : Complaints are occasionally de that individual magistrates refuse to receive declara- ıs, but they have been very infrequent. The Secretary State has no authority to give the instructions suggested the last part of the question, but he has repeatedly said t it is the duty of justices to take care that no unnecessary iculties are put in the way of those desirous of exercising ir statutory rights.

THURSDAY, JULY 5TH.

Tuberculosis in Scotland.

Ir. **MURNIN** asked the Under Secretary to the Scottish ard of Health the number of persons who died in Scotland ing 1921–22 from tuberculosis.—Captain **ELLIOT** replied : e number of deaths in Scotland from tuberculosis was 37 in the year 1921 and 5818 in 1922.

Small-pox and Chicken-pox.

Major Sir **FREDERICK KELLEY** asked the Minister of Health ether, in view of the danger that mild cases of small-pox ght not be recognised as such, he would consider the issue a statement instructing parents and others how incipient all-pox may be distinguished from chicken-pox.—Lord PERCY replied : My right hon. friend does not consider it the issue of such a statement would be of advantage. is the function of the medical practitioner in attendance on a patient to distinguish incipient small-pox from cken-pox, and the services of the medical officer of health at his disposal in assisting in the diagnosis of doubtful es.

Deaths from Small-pox.

Mr. **TREVELYAN THOMSON** asked the Minister of Health e percentage of deaths to cases of small-pox in each of the t five years, showing separately the figures for those ccinated and those who had never been vaccinated.— rd E. **PERCY** replied : As the protection afforded by ccination diminishes with lapse of time, I have divided e deaths of vaccinated persons into age groups. The figures e as follow :—

Percentage of Deaths to Cases of Small-pox.

Year.	Vaccinated.			Unvaccinated.
	10 years and under.	Over 10 and under 40.	40 and over.	
18	—	3·4	3·4	Nil.
19	—	0·6	3·2	20·8
20	—	1·5	8·3	13·8
21	—	—	1·0	1·5
22	—	0·4	4·1	1·6

Health Absences of School-children.

Mr. **EDE** asked the President of the Board of Education if would be prepared to recognise absences of children from ementary schools to receive sanatorium, hospital, or other edical treatment when such absences were ordered by the hool medical officer or the medical officer of health as nking with those specified in paragraph 23 (*c*) of Schedule 4 the Code and would allow them to count as attendances ıder Article 44 (*h*) of the Code, thereby removing an anomaly at became increasingly apparent with the growing vigilance the school medical service of the country.—Mr. E. **WOOD** plied : The suggestion made in the question raises points financial and administrative importance, and I cannot ommit myself to reconsider the existing arrangements at the esent time.

Pensioners and Medical Treatment.

Mr. **ROBERT YOUNG** asked the Minister of Pensions what as the number of pensioners who were receiving medical eatment, how many of these were in military hospitals, ow many were in general hospitals, how many were ceiving home treatment, and of the total number how any were undergoing treatment which prevented them ing employed in any occupation.—Major **TRYON** replied : here are approximately 76,500 officers and men receiving eatment at the cost of my department, of whom about 1,600 are prevented by the treatment from following their cupations. Of the total mentioned, 18 are in military ospitals, 3650 are in general hospitals, and 9300 are receiving ome treatment. These figures do not include men receiving eatment, without allowances, from their panel practitioners, f whom I have no record.

MONDAY, JULY 9TH.

Infantile Mortality.

Mr. A. V. **ALEXANDER** asked the Minister of Health the number of deaths of children for each year from 1914 to 1922, giving separate figures for illegitimate children and covering the ages of under 12 months, over 1 year and under 2 years, and over 2 years and under 3 years respectively.—Mr. **CHAMBERLAIN** replied : No figures respecting deaths of illegitimate children of 1 to 2 years or 2 to 3 years of age are available prior to 1919, when they were first abstracted. The rest of the required figures are given below :—

Deaths : England and Wales.

—	Under 1 year.		1–2 years.		2–3 years.	
	Total.	Illegitimate.	Total.	Illegitimate.	Total.	Illegitimate.
1914	91,971	7,712	24,967	—	10,072	—
1915	89,380	7,369	30,279	—	12,482	—
1916	71,646	6,000	20,000	—	8,611	—
1917	64,483	7,474	20,296	—	9,724	—
1918	64,386	7,694	26,447	—	14,955	—
1919	61,715	7,237	14,124	1,131	7,658	469
1920	76,552	7,017	14,741	1,162	6,100	364
1921	70,250	6,115	15,636	1,041	4,994	336
1922	60,121	4,736	18,948	1,064	8,678	453

Illegitimate Births.

Mr. A. V. **ALEXANDER** asked the Minister of Health the number of children born in each of the years from 1914–22, giving the numbers separately for illegitimate births.—Mr. **CHAMBERLAIN** replied : The numbers of children born (total and illegitimate) for each year 1914 to 1922 are shown below :—

Births : England and Wales.

Year.	Total.	Illegitimate.	Year.	Total.	Illegitimate.
1914	879,096	37,329	1919	692,438	41,876
1915	814,614	36,245	1920	957,782	44,947
1916	785,520	37,689	1921	848,814	38,618
1917	668,346	37,157	1922	780,124	34,138
1918	662,661	41,452			

TUESDAY, JULY 10TH.

Scottish Public Health Authorities.

Mr. **DUNCAN MILLAR** asked the Under Secretary to the Scottish Board of Health whether, in view of the widespread anxiety and apprehension created by the Report of Scottish Board of Health Consultative Council recommending the abolition of the parish councils in Scotland and of the smaller burghs and public health authorities, he could give an assurance that no steps were at present contemplated to give effect to the views of the Consultative Council, and that the fullest opportunity would be afforded to the parish councils and burghs and other public health authorities to express their views before any decision was arrived at.—Captain **ELLIOT** replied : I am now aware that the publication of the Report referred to has created anxiety and apprehension, but the hon. Member may rest assured that no decision will be taken on the matters referred to without full opportunity to the local authorities mentioned to express their views.

Selection of R.A.M.C. Officers.

Mr. **BECKER** asked the Under Secretary of State for War if all officers in the Royal Army Medical Corps eligible for selection to the higher ranks were personally interviewed by the selection board ; and could he give his assurance that none would be passed over who had not been so interviewed.—Lieut.-Colonel **GUINNESS** replied : The answer is in the negative. I do not think that a system of inviting officers to attend and make out a case for their own promotion would be at all satisfactory, even if all the officers concerned were always available for such attendance, which they are not. It rarely happens, however, that an officer is not known personally to the majority of the selectors.

Appointments.

DENT, HELEN P., M.B., B.S. Lond., has been appointed Maternity and Child Welfare Medical Officer, Leicester.

GALBRAITH, S. N., M.B., Ch.B. Glasg., Medical Officer of Health for South-West Kent.

GIMBLETT, CHARLES LEONARD, M.D. Camb., F.R.C.S. Eng., Hon. Assistant Surgeon to the Royal Westminster Ophthalmic Hospital.

KIEP, W. H., M.B., Ch.B. Glasg., an Hon. Ophthalmic Surgeon to the Royal Ear and Eye Hospital, Bradford.

Certifying Surgeons under the Factory and Workshop Acts : **MCNAUGHTAN, W.**, M.B., Ch.B. Edin. (Hawes) ; **DOBSON, J. G.**, M.B., Ch.B. Edin. (Chirnside) ; **LOWRY, E. W.**, M.R.C.S., L.R.C.P. Lond. (Brentford and Ealing) ; **ARTHUR, W. B.**, L.R.C.P. & S. Edin., L.R.F.P.S. Glasg. (Wingate).

Vacancies.

For further information refer to the advertisement columns.

Blackburn and East Lancashire Royal Infirmary.—Third H.S. £250.
Bradford Royal Infirmary.—H.S. £150.
Braintree and Dunmow United Sanitary Districts.—M.O.H. £700.
Bristol Mental Hospital.—M.O. and Pathologist. £400.
Cheshire Joint Sanatorium, Loggerheads.—A.M.O. £350.
Chester, East Lancashire Tuberculosis Colony, Barrowmore Hall, Gt. Barrow, near Chester.—Med. Supt. £800.
Chesterfield and N. Derbyshire Royal Hospital.—Cas. O. and Orthopædic Surg. £170.
Derbyshire Sanatorium, Chesterfield.—Locum A.M.O. £300.
Dreadnought Hospital, Greenwich, S.E.—H.P. £150.
East African Medical Service.—M.O. £600.
East London Hospital for Children.—H.P. £125.
Evelina Hospital for Children.—H.P. £160.
Glasgow University.—Chair of Public Health.
Gloucester City.—M.O.H. £1000.
Hospital for Consumption and Diseases of the Chest, Brompton.—H.P.
Leeds General Infirmary.—Orthopædic H.S.
Manchester Radium Institute.—Anæsthetist. £100.
Manchester Royal Infirmary.—H.S. Aural, &c., Depts. £100. H.P.'s. £100. Surg. Registrar. £150. H.S.'s. £100.
Middleton-in-Wharfedale Sanatorium, Ilkley.—Res. A.M.O. £325.
Miller General Hospital for South-East London, Greenwich-road, S.E.—H.P. £150.
National Hospital for Diseases of the Heart, Westmoreland-street, W.—Res. M.O. £150.
Northampton General Hospital.—Two H.S.'s. Each £200.
Norwich City.—Temporary Assistant in Public Health Dept. £10 per week.
Nottingham Children's Hospital—Res. H.S. £150.
Poplar Hospital for Accidents.—Locum Tenens Senior Res. Surg.
Preston, Lancs, County Mental Hospital, Whittingham.—Locum Tenens M.O. £8 8s. per week.
Rotherham Hospital.—Jun. H.S. £150.
Royal Naval Medical Service.—Surgeon-Lieutenants.
Royal Waterloo Hospital for Children and Women, Waterloo-road, S.E.—Cas. O. £150.
Salford Royal Hospital.—Honorary Dental Surgeon.
Stoke-on-Trent County Borough.—Asst. M.O. £500.
Tiverton Hospital, Devon.—H.S. £100.
Wandle Valley Isolation Hospital.—R.M.O. £400.
West African Medical Service.—M.O. £660.
Windermere.—Ethel Hedley Hospital for Crippled Children. H.S. £150.
Wolverhampton and Staffs Hospital.—H.S. £150.
Wrexham Infirmary.—H.S. £150.

Births, Marriages, and Deaths.

BIRTHS.

BARRY.—On June 24th, at Hyde Park Barracks, the wife of Captain S. J. Barry, R.A.M.C., of twin sons.

KELLOCK.—On July 4th, at Upper Wimpole-street, W., the wife of the late T. H. Kellock, M.D., M.Ch., F.R.C.S., of a son.

LONGSTAFF.—On July 3rd, at Picket Hill, near Ringwood, the wife of Dr. T. G. Longstaff, of a daughter.

MADGE.—On July 4th, at Brookside, Ashbourne, Derbyshire, the wife of Dr. Quintus Madge, of a son.

MORLEY.—On June 28th, at "Grasmere," Mill Hill, N.W., the wife of Allan Morley, M.B. Lond., of a daughter.

MARRIAGES.

FERRIER—CONEY.—On June 26th, at Studland Church, Swanage, David Ferrier, M.D., of Dunstable-road, Luton, to Adeline Maud Coney, daughter of the late S. W. Coney, Bournemouth.

POSTLETHWAITE—CLAYTON.—On July 3rd, at St. Augustin's Church, Bournemouth, William Barry Postlethwaite, M.B., M.C., to Barbara Clayton, the younger daughter of Dr. and Mrs. A. J. Clayton, of Wimborne-road, Bournemouth.

DEATHS.

BURY.—On July 4th, at Galtee House, Foxley-lane, Purley, Surrey, George Bury, L.R.C.P., M.R.C.S., aged 93.

KIRBY.—On July 3rd, at Bromley Lodge, Bromley, Kent, Dr. Albert Edward Kirby, M.R.C.S. Eng., aged 74.

MURIEL.—On July 3rd, at Glenfield, Whitehaven, George John Muriel, J.P., M.R.C.S. Eng., in his 81st year.

SAYER.—On July 7th, after a prolonged illness, Dr. Ettie Sayer, M.B., B.S., of Ennismore-gardens, W.

STEWART.—On July 3rd, at his home, Yeoveney, Alexandra-road, Watford, suddenly from heart failure, Alexander Brodie Seton Stewart, late of Leeds, Lieut.-Colonel, R.A.M.C.(T.), O.B.E., T.D., Order of St. Sava of Serbia.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Comments, and Abstracts.

FURTHER NOTES ON SMALL-POX DIAGNOSIS

BY W. MCCONNEL WANKLYN, B.A. CAMB.,
M.R.C.S. ENG., D.P.H.

To include within a few lines, such as those published in THE LANCET on July 7th, all that should be understood upon this subject is clearly impracticable; the following additiona notes may therefore be useful. As the subject is one of the humblest of our professional duties and one which we are endeavouring to get rid of as soon as possible, so also is it one of absolutely fundamental importance for each one of us to tackle until our island is cleared of small-pox beyond any possibility of its return. The laity are keenly alive to the financial risks; when those risks mature they require someone's blood. That is the fact. Many of us may never have a suspected case; some are dead certain to have one or more; and yet others, if unprepared, may thereby be ruined. Wherefore the main point and kernel of interest for us in the matter is not any clinical, academic, or epidemiological feature per se; we have no time for such; but it is this. Can I be reasonably sure of at least challenging any single case of this odious disease that may drift my way? It is with such a query in mind that your readers may be pleased to glance at the notes of the following case, placed at my disposal by one of the various colleagues with whom I have had the pleasure of seeing cases in consultation. An effort is being made to file and reproduce such cases for mutual guidance, and any other notes of the kind will be welcomed. Only those points have been brought out which are likely to be of direct value to the reader, when faced with an awkward case.

An Awkward Case.

The case was that of S. S., a female, aged 6. It was obviously either small-pox or chicken-pox. A count of the spots showed as follows:—Right hand, 5; right forearm. 1; right arm, 10; right foot, 3; right leg, 4; right thigh, 15; left foot, 2; left leg, 4; left thigh, 11; face, 15; front of trunk, 50. This, taken with the superficial and peculiar character of the vesicles, and the absence of initial or constitutional symptoms, was sufficient to establish a diagnosis of chicken-pox. There remained for consideration the rash on the left upper extremity. This was very remarkable. On the left hand were 14 lesions, on the left forearm 4, on the left arm 10. It was the remarkably thick crop on the left hand which led to this case arousing a suspicion of small-pox. But when the facts were gone into this was noted. Previous to her attack of chicken-pox, the child had been suffering from an acutely septic condition of the left hand, for which she had been attending hospital, and it was upon this inflamed area that a numerous and well-developed crop of vesicles had settled.

Herein we come upon a phenomenon which, well known in small-pox, is also present in chicken-pox to a less degree, that is the selection by the rash of irritated surfaces. This much at least comes out as noteworthy, that that factor itself is not pathognomonic of small-pox. I have seen numerous remarkable instances of the same phenomenon in chicken-pox. In one recent case the outline of the garters below the knees in an adult was conspicuously picked out by the rash of small-pox. I have also seen scratch marks picked out by the rash of chicken-pox and other similar sites of irritation, such as those on the skin of ill-tended children.

Four Main Criteria.

It comes to this; that there is no single golden rule, no measuring tape or touchstone by which we can say: This is chicken-pox; that is small-pox. In nine cases out of ten in which the diagnosis rests between chicken-pox and small-pox in an adult, a count of the spots on the upper extremities will correctly point to the truth. In the tenth, it may not so point, as was demonstrated to me by a case only two or three days ago. In children there is more variety in the distribution of the rash of chicken-pox than there is in adults. It more often varies from the accepted type. In all the cases, however, which I can recall, the degree of prostration has been a valuable sign. That is seldom so marked in any case of chicken-pox as it is in small-pox; and it is a remarkable point that where a copious rash due to chicken-pox occurs in a patient, in that patient there is commonly no such degree of prostration as almost invariably occurs in an attack of small-pox of corresponding degree. The four main points which I have consistently found to be most useful in my work are: (1) The distribution of the rash; (2) the degree of prostration; (3) the relative depth of the lesions in the skin; and (4) the maturation of the lesions.

There seldom occurs a case in which the evidence drawn m the facts grouped under these four heads and duly ighed fails to yield a correct decision. And such evidence s this further advantage, that it is readily accessible.

THE WELFARE OF MENTAL PATIENTS.

Two gatherings, important in relation to the welfare of ntal patients, were held in London on July 12th.

The Mental Hospitals Association

et at the Guildhall. Among the items on a full agenda was report of the Executive Committee commenting on the ental Treatment Bill recently introduced. It is accepted at the clauses, which are not in effect so far-reaching as s desired by the Association, contain provisions which, ien passed into law, cannot fail to prove beneficial to those ffering from incipient or recurring mental illness. The Bill s received the careful consideration of the Committee which s addressed a communication to the Minister of Health on various provisions. It is urged that as a general inciple it is undesirable to coöpt members on visiting committees who are not directly elected by the ratepayers, and that is not equitable to give persons who are not directly responle to the ratepayers, power to coöperate in the direction of e expenditure of the ratepayers' money. As to out-patients, visiting committee would not be able, it is thought, to ntribute to the cost of an out-patient department for ental treatment in a general hospital. Moreover, where, in many instances, the mental hospital is situated at a nsiderable distance from large centres of population, it ight be desirable to institute an out-patient department vay from the mental hospital. The members have been ked by those interested in the management of private stitutions and registered hospitals who are subscribers to eir Association to urge that no restrictions should be set under the Bill on the facilities such institutions now have connexion with the reception, maintenance, and discharge voluntary boarders. In the opinion of the executive the ovisions of the subsection of the Bill dealing with afterre militate against the voluntary principle; they consider undesirable that after a patient has been discharged from ial he should be in any way associated with the institution. ther minor criticisms are made. Representatives of the ssociation on the Joint Conciliation Committee have been nferring with the National Asylum Workers' Union for me months past as to the possibility of stabilising, by proving the conditions of service of, the nursing staff in ental hospitals. It is held that probationers should be bject to medical examination before engagement and that ey should have reached a certain standard of education—g., have passed either the seventh standard at an elementary hool, or the Junior Oxford or Cambridge Local Examination, d that the governing authorities be requested to dispense ith the services of any probationer nurse who does not make ue and diligent efforts to attain the recognised standard proficiency. The formation of a sports club in every stitution to promote recreation among the staff is ggested. It was stated that the Joint Committee have een involved in correspondence with the Ministry of Health s to the constitution and proceedings of a committee set p by the Board of Control, "to consider the nursing service county and borough mental hospitals and in what direction can be improved," to which the Joint Committee were not vited to send representatives. As the constitution of the oard of Control's Committee did not commend itself to embers of the Joint Committee, it had been unanimously ecided not to accept the offer of the Ministry and of the oard of Control to give evidence and submit themselves or eir representatives to cross-examination as to their proceedgs; but the Joint Committee would continue to furnish e Board, as had been its practice in the past, with copies of e various recommendations which the Joint Committee ay from time to time decide upon.

The inaugural meeting of the

National Council for Mental Hygiene

as held at Caxton Hall, Westminster. The chairan of the Council is Sir Courtauld Thomson and he joint hon. secretaries Dr. J. L. Birley and Lieut.-olonel J. R. Lord. In America a national committee r mental hygiene has been doing valuable work for a number f years, and an international mental hygiene movement has ow been launched. The chief purposes of the movement are work for the conservation of mental health; to promote he study of mental disorders, mental defects, and delinquency all their forms and relations; to obtain and disseminate eliable data concerning them, to help to raise the standard f care and treatment, and to coördinate existing agencies. he special aims of the British National Council include mong others: the improvement of the mental health of the ommunity; the study of the causes underlying congenital nd acquired mental disease with a view to its prevention; the securing of a more important position for the study of psychiatry in the medical curriculum and the closer association of psychiatry with general medicine; to further the establishment of special clinics and out-patient departments for the early treatment of mental disorders, and to raise the standard of care and treatment in the public mental hospitals; the study of criminality, dependency, vagrancy, and prostitution, in so far as they are failures of adjustment by reason of mental disease or defect; the study of mental hygiene of child-life in relation to education and parental responsibility. The Council hopes to be the liaison between all societies, associations, and other bodies interested in or concerned with mental hygiene, and as far as it can with advantage coöperate with them. The annual subscription for full members is 1 guinea, for associate members 5*s*. Donations may be sent to hon. treasurer, Lord Southborough, at Room 55, Windsor House, Victoria-street, London, S.W. 1.

A BIBLIOGRAPHY OF SOCIAL HYGIENE.

A comprehensive bibliography of social hygiene, demography, and vital statistics has just been issued by Prof. A. Grotjahn and Dr. phil. F. Kriegl, edited by Dr. Hans Haustein, of Berlin. (Berlin: Richard Schoetz. 1923. Pp. 262. 4*s*.) The pamphlet contains some thousands of references in various languages to books and papers which appeared in the year 1921, under headings which include the social hygiene of work, of food, of dwelling and clothing for children and young persons, social insurance, and the hygiene of reproduction. The pamphlet will be found a useful work of reference by all who are working in a field to which post-war conditions have given a very urgent importance.

A DETOXICATED PHOTOGRAPHIC DEVELOPER.

Metol, introduced in 1891 as a photographic developer, suffers from the drawback of being seriously irritating to the skin. This is the case with the ordinary commercial form, but it has now been shown by Mr. W. F. A. Herman (*Chemistry and Industry*, May 18th), working in the department of photographic research of the British Dyestuffs Corporation, that pure metol is quite innocuous to the skin. That this was the case has long been suspected, but Mr. Herman has been able to isolate and determine the constitution of the poisonous impurity. By adopting a modification in manufacture, metol free from irritant action can now readily be produced, and Mr. Herman has conferred a boon upon photographers.

A REGISTER BOOK FOR DANGEROUS DRUGS.

Messrs. John Wright and Sons, Ltd., have brought out a register recording the purchase, sale, and stock-in-hand of such dangerous drugs as are scheduled under the Act of 1920. It is intended for the use of medical men, and the preface contains extracts from the regulations issued by the Home Office in Janurary, 1923, including those applicable to (1) all doctors; (2) dispensing doctors. Different coloured pages with thumb-index are provided for records of morphine and salts, diamorphine (heroin) and salts, cocaine and ecgonine and salts, and medicinal opium. The whole is issued in a handy form at 7*s*. 6*d*.

COLONIAL HEALTH REPORTS.

Nyasaland.

The report for this Protectorate for 1921, for some reason delayed, has now been presented to Parliament. It states that during the year the general health was satisfactory. In the Mlanje district small-pox broke out from time to time, apparently introduced from Portuguese East Africa. In other areas the outbreaks were of a sporadic nature and were easily controlled. Two cases of bubonic plague were reported from the North Nyasa district, but neither case was seen till after death. Although careful investigation was made no further cases were revealed, neither was there any noticeable epizootic disease among the rats with which the district is infested. Barium carbonate was reported to be the most satisfactory of the various rat poisons with which experiments were made during the year. As regards the treatment of venereal disease, experience seems to show that the mental attitude of the native is the same towards this disease as towards others, and that treatment is not usually sought until serious inconvenience is occasioned. Nevertheless, venereal hospitals for the treatment of natives were opened in seven districts during 1921, and the returns show that a beginning has been made in familiarising the people with the opportunities afforded them at these treatment centres. At the venereal hospitals the treatment of yaws is also undertaken, and later on it may be possible to deal more thoroughly with this disease, which is endemic and widely prevalent in the Dedza district. The medical staff was increased during the year, and this fact, combined with other circumstances, enabled medical aid to be extended to districts hitherto unprovided for. Indian subassistant surgeons are stationed at posts of secondary importance, and, in addition, rural dispensaries are being opened in the more populous centres in each district under the charge of natives trained for the purpose and visited periodically by medical officers or subassistant surgeons. It is hoped that such schemes for increasing the medical facilities afforded to natives in remote districts will be further developed and extended in other directions as soon as the finances of the Protectorate permit. It is understood that the drug Bayer "205," which is being experimented with in the Northern Rhodesia, is a decided advance on any treatment which has hitherto been employed in the cure of trypanosomiasis. The medical entomologist is studying the preventive side of this disease. As regards sickness amongst the European population, 366 cases were treated during the year by the medical department, and there were 12 deaths. Malaria was responsible for 28 per cent. of the cases dealt with, and, of course, many cases of malaria are self-treated and do not come under official cognisance. Gastro-intestinal disorders, respiratory complaints, and dysentery made up the bulk of the other cases treated. There were 14 cases of blackwater fever, resulting in two deaths. European and native hospitals are maintained by Government at Blantyre, Zomba, and Fort Johnston, and additional native hospitals at Port Herald, Mlanje, and Karonga; others are in course of erection or are to be built later. The various missions established in the Protectorate continue to do a considerable amount of medical work. According to the census taken in April, 1921, the population of Nyasaland was 1486 Europeans, 563 Asiatics, and 1,199,934 natives (558,138 males and 641,796 females). The climate in its essential features is similar to that of the rest of Eastern Africa within the tropics. As a large proportion of the Protectorate lies at an altitude of 3000 feet or more the heat is not generally excessive.

Falkland Islands.

Mr. H. Henniker-Heaton, colonial secretary, in his report for 1921, states that according to the census taken in April of that year the total population of the colony, exclusive of crews of ships in harbour in Stanley, numbered 2087 (males 1182, and females 905). South Georgia, the only part of the dependencies which is permanently habitable, had at the same time a population of 1337 (of whom only three were females), mainly engaged in whaling, no fewer than 998 being set down as natives of Sweden or Norway. The Falkland Islands proper, consisting of East Falkland and West Falkland, are entirely devoted to sheep-farming; in general appearance they are treeless, bleak, and inhospitable, resembling closely parts of the north-west coast of Scotland and the Shetland Islands. The inhabitants are almost exclusively people of pure British descent; they are hardworking, thrifty, and peaceable. The climate is generally healthy, and there is neither endemic nor epidemic sickness in the country. In the dependencies, also, there is very little sickness, even colds being of rare occurrence, though some unhealthiness is caused by the absence of fresh provisions.

INSULIN "A.B." BRAND.

THE British Drug Houses, Ltd., announce that increased output of insulin "A.B." brand has enabled them to effect a reduction in its price from 2*s.* 6*d.* to 1*s.* 9*d.* per dose. Bottles containing 5 c.cm. (100 units or 10 doses) are now priced at 17*s.* 6*d.* per bottle; bottles containing 10 c.cm. (200 units or 20 doses) at 35*s.* per bottle. These prices have been arranged in agreement with the Medical Research Council and are effective as from July 12th, 1923. Supplies of insulin "A.B." brand now available are sufficient to meet all demands.

GAS CYLINDERS IN HOT WEATHER: SAFETY FIRST.

THE explosion of a gas cylinder in the operating theatre of a London hospital early this week—most fortunately without harm to life or limb—is a reminder of the fact that respect must be paid to the laws of expansion of liquids and gases, although almost complete immunity from such accidents in medical practice has led to their being overlooked. Oxygen and hydrogen being non-liquifiable at ordinary temperatures expand in orderly fashion, and although it is undesirable to expose such cylinders to direct sunshine the risk is not very great. But in the case of CO_2 and N_2O, which are present in liquid form in the cylinders, the coefficient of expansion is much greater than that of gases; hence, to guard against risk, these cylinders are only partially filled with liquid. The manufacturers enjoin strict precautions on their own staff. The British Oxygen Company, Ltd., for instance, issue a special summer notice to the effect that during hot weather full cylinders must not be left exposed to the sun in any part of the factory, and that naked cylinders conveyed in open vans, trucks, or by hand, must be covered.

A MONOGRAPH ON DEATH.

Dr. Eugen Holländer has brought out a German edition of Dr. F. Parkes Weber's well-known monograph on Death, under the title of Des Todes Bild. (Berlin: F. Fontane and Co. 1923. Pp. 274.) In a preface, addressed to the author, whose acquaintance he made shortly before the war "in the beautiful home of the Royal Society of Medicine in London," he speaks of medical men as having been in the past leaders and heralds of peace in all parts of the world and destined to play a part in putting on the lines again the derailed wheels of culture. Death, he says, has lost its terrors for hundreds of thousands of German families, and the problems of life and death have come nearer home to many who were not in the ordinary way philosophers; and Dr. Holländer instances the enormous increase in the German book trade as proof of the hunger after mental food and as a salutary counterpoise to mysticism and the resort to priestcraft. Apart from the preface, he has not added to Dr. Weber's book (which has on economical grounds been much abbreviated) material of his own, "in view of the completeness of the original." His prefatory remarks conclude with a note on euthanasia, or the teaching of the right manner of dying, as a lost art, which has, more than any other medical science, lapsed into forgetfulness. Alongside the ideal of a beautiful life stands as equally to be desired a beautiful death.

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith-road, W.

MONDAY, July 16th.—10 A.M., Mr. Maingot: Surgical Pathology. 2 P.M., Mr. Addison: Surgical Wards. 3 P.M., Mr. Simson: Diseases of Women.

TUESDAY.—10 A.M., Mr. Steadman: Dental Dept. 12 noon Dr. Burrell: Chest Cases. 2.30 P.M., Dr. Pritchard Medical Wards.

WEDNESDAY.—10 A.M., Dr. Saunders: Medical Diseases of Children. 11 A.M., Mr. Simson: Gynæcological Demonstration. 2.30 P.M., Mr. Donald Armour: Surgical Wards.

THURSDAY.—10 A.M., Dr. Grainger Stewart: Neurological Dept. 2 P.M., Mr. Bishop Harman: Eye Dept. 2 P.M., Mr. MacDonald: Genito-Urinary Dept.

FRIDAY.—10 A.M., Dr. Drummond Robinson: Gynæcological Operations. 12 noon, Mr. Endean: Venereal Diseases. 2 P.M., Mr. Banks-Davis: Throat, Nose and Ear Dept.

SATURDAY.—9.30 A.M., Dr. Burnford: Bacterial Therapy. 10 A.M., Dr. Saunders: Medical Diseases of Children. 10 A.M., Mr. Banks-Davis: Operations on Throat, Nose, and Ear.

Daily, 10 A.M. to 6 P.M., Saturdays, 10 A.M. to 1 P.M., In-patients, Out-patients, Operations, Special Departments.

SOUTH-WEST LONDON POST-GRADUATE ASSOCIATION, St. James' Hospital, Ouseley-road, Balham, S.W.

TUESDAY, July 17th.—4.30 P.M., Mr. Leonard Phillips: The Scope of Cæsarean Section.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.

Demonstration of Clinical Cases at 3.30 P.M.

MONDAY, July 16th.—Mr. Aubrey Goodwin: Gynæcological.
TUESDAY.—Dr. J. Metcalfe: Radiological.
WEDNESDAY.—Mr. C. H. Hayton: Throat and Nose.
THURSDAY.—Dr. Yealland: Medical.
FRIDAY.—Mr. E. Gillespie: Surgical.

QUEEN CHARLOTTE'S LYING-IN HOSPITAL, Marylebone-road, N.W.

THURSDAY, July 19th.—5 P.M., Mr. L. C. Phillips: The Treatment of Ante-partum Hæmorrhage.

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CONTENTS

THE WHOLE OF THE LITERARY MATTER IN THE LANCET IS COPYRIGHT.

RESIDENTIAL ADDRESS

on Considerations, Bacteriological, Toxicological, Hæmatological, and others thereto akin, bearing upon the Psychoses. By EDWIN GOODALL, C.B.E., M.D., B.S., F.R.C.P. 105

ORIGINAL ARTICLES

ronchomoniliasis. By TH. JOEKES, M.B., M.R.C.S., and R. H. SIMPSON, M.D., M.R.C.P., D.P.H. —(*Illustrated*) 108
ental Tests for Delinquents, and Mental Conflict as a Cause of Delinquency. By M. HAMBLIN SMITH, M.D., and G. W. PAILTHORPE, M.B., B.S. 112
he Inter-Relationship of Blood-Fat and Blood-Sugar. By T. H. OLIVER, M.D., M.R.C.P., and A. HAWORTH, M.Sc., M.B., Ch.B.—(*Illustrated*) 114
Series of Cases of Tuberculosis Treated with Spahlinger's Vaccine. By E. H. COLBECK, M.D., F.R.C.P., and S. ROODHOUSE GLOYNE, M.D., D.P.H. 116
cute *Bacillus coli* Infection of the Gastro-Intestinal Tract in a New-born Baby, Contracted from its Mother. By REGINALD C. JEWESBURY, M.D., F.R.C.P., and LEONARD S. DUDGEON, C.M.G., C.B.E., F.R.C.P. 118
Case of Quintuple Pregnancy. By S. R. FOSTER, *M.C.*, M.B., B.Ch., B.A.O., and WILLIAM CARSON, M.B., B.Ch., B.A.O. 120
yphus Fever Epidemic Among the Greek Refugees. By Sir PATRICK HEHIR, K.C.I.E., C.B., C.M.G., M.D., F.R.C.S., F.R.C.P.—(*To be continued*) 153

MEDICAL SOCIETIES.

edico-Psychological Association of Great Britain and Ireland .. 120
ational Association for the Prevention of Tuberculosis 122

EVIEWS AND NOTICES OF BOOKS.

he Blood-Supply to the Heart. By Louis Gross, M.D., C.M. 124
The Sympathetic Nervous System in Disease. By W. Langdon Brown, M.A., M.D., F.R.C.P. .. 125
Chronologia Medica. By Sir D'Arcy Power, K.B.E., F.R.C.S., and C. J. S. Thompson, M.B.E. 125
Atoms. By T. C. Wignall and G. D. Knox........ 125
Einführung in die Klinik der Inneren Sekretion. By Prof. Dr. G. Peritz.. 126
L'encéphalite épidémique. By Dr. Louis Reys 126
Manuel de neurologie oculaire. By F. de Lapersonne and A. Cantonnet 126
Herzkrankheiten. By Dr. P. Schrumpf 126
Die Medizin der Gegenwart in Selbstdarstellungen. Vols. I and II. Edited by Prof. L. R. Grote.... 126

LEADING ARTICLES.

RESEARCH IN MENTAL DISEASE 127
THE INTERNATIONAL CONGRESS OF SURGERY..... 127
THE SPAHLINGER TREATMENT 128

ANNOTATIONS.

Medical Examinations for Motor Drivers 129
Puerperal Morbidity 129
A Medical Gathering at the South London Hospital 129
Is Reinfection of Tuberculosis from Within or from Without? 130
A Tribute to the Mayo Clinic 130
The Beit Memorial Fellowships 131
Bronchial Asthma due to Mice 131
On Small-pox Diagnosis (*Illustrated*) 132
Help in the Search for References 132
The Relief of Leprosy in the British Empire..... 133
Annual Meeting of the B.M.A. 133

MODERN TECHNIQUE IN TREATMENT.

XXIX.—The Treatment of Habitual Constipation. By ARTHUR F. HURST, M.D., F.R.C.P. 134

INDEX NOTICE.

THE LANCET, Vol. I., 1923 133

OBITUARY.

Donald Murray, M.B., C.M., D.P.H. 139
Ettie Sayer, M.B., B.S.... 139

SPECIAL ARTICLES.

Imperial Cancer Research Fund: Annual Report.. 135
Sixth Congress of the International Society of Surgery: Inaugural Session.—First Scientific Session.—(*To be continued*) 144
Provident Association for Hospital and Additional Medical Services: Report for Period Nov. 1st, 1921–Feb. 28th, 1923 137
Research in Tropical Disease: IV. The Wellcome Bureau of Scientific Research 137
Berlin: The Title of "Specialist."—Meeting of Socialist Doctors.—Control of New Drugs.—Conditions in the Rhenish Spas 138

PUBLIC HEALTH SERVICES.

Willesden Municipal Health Service 140
Mental Hospitals Service: Four County and Borough Hospitals 140
School Medical Service: Dewsbury.—Warwickshire 140

CORRESPONDENCE.

The Best Dental Anæsthetic for Children (Dr. Stephen Coffin) 141
L'Affaire Spahlinger (Dr. Charles Perrier, Dr. E. Trechsel)—(*Illustrated*) . 141
Mental Hospitals Service (Dr. Henry Yellowlees). 143
The Lingual Tonsil in Relation to the Singing Voice (Sir James Dundas-Grant) 143
The Rôle of the Tooth-Brush (Mr. Thaddeus P. Hyatt) 143
The Driving Grip in Golf (Mr. David Anderson) . 154

THE SERVICES.

Royal Naval Medical Service.—Royal Army Medical Corps.—Indian Medical Service........ 144

MEDICAL NEWS.

University of London: King's College Hospital Medical School 147
University of Oxford: Radcliffe Scholarship in Pharmacology; Theodore Williams Scholarships: Beit Fellowship 147
University of Manchester: Medical Degree Day.... 147
University of Durham ... 147
University of Aberdeen... 147
Royal College of Surgeons of England 148
Rendlesham Hall, Suffolk. 114
Annual Dinner of the Medico-Psychological Association 122
Royal Medical Benevolent Fund 133
Small-pox in England and Wales 133
Aberdeen Joint Hospitals Site 139
Bury Infirmary Extension 139
Epsom College 141
Royal Society of Arts 148
Society for the Prevention of Venereal Disease 148
Royal Northern Hospital, London 148
Extension of Blackburn Royal Infirmary 148
London Hospital Medical College 148
London School of Tropical Medicine 148
Royal Sussex County Hospital 148
The Lunatic Asylums in Burma 148
Small-pox Precautions in Territorial Training Camps 148
Free State County Councils and Health Reform 148
Donations and Bequests . 151
Royal Sanitary Institute . 152

PARLIAMENTARY INTELLIGENCE.

House of Commons: Cost of Pensions Patients.—Small-pox and Vaccination.—Brook Fever Hospital.—Medical Aid Departments.—Dirty Milk Vans.—Panel Practitioners' Remuneration.—Discharge of Private Lunacy Patients.—Deaths from Tuberculosis.—Cheese, Milk, and Cream Standards.—Medical War Records.—Treatment for War Neurosis.—Final Pension Appeals in 1921.—Institutional Treatment of Tuberculosis.—Wounds on Executed Prisoner.—Infection in Public Libraries.—Fifty per cent. Pension Awards.—White Lead Convention 149

NOTES, COMMENTS, AND ABSTRACTS.

Medical Work of the Mission to Lepers 153
A New Gas-mask 154
The Trained Climber 154
Professional Classes Aid Council 154
Medical Diary 152
Appointments 152
Vacancies............... 152
Births, Marriages, Deaths. 152

DISEASES OF THE NEWBORN.

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ABSTRACT OF A

Presidential Address

ON

CONSIDERATIONS,

BACTERIOLOGICAL, TOXICOLOGICAL, HÆMATOLOGICAL, AND OTHERS THERETO AKIN, BEARING UPON

THE PSYCHOSES.

elivered before the Medico-Psychological Association of Great Britain and Ireland on July 10th, 1923,

By EDWIN GOODALL, C.B.E., M.D., B.S.,
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In the course of toxic and febrile processes, such as ccur in association with typhoid, erysipelas, malaria, neumonia, influenza, psychoses may arise. Amongst fection-psychoses may be counted insanity of the uerperium ; in association with epidemic encephalitis arious psychoses develop, a fact of significance in the roblems of the pathogenesis of these states. Of eculiar interest is the occurrence of disorders of otility in the course of and after this disease, sembling muscular disorders in katalepsy and atatonia. A recent and valuable addition to the terature of this subject is furnished in an article by kliar, who has had the unusual experience of seeing ental disturbances in the course of typhus and lapsing fever, prevalent in Russia during the three inters, 1918–1920, inclusive. He also describes five ases of lyssa in which psychotic disturbances occurred. hese disturbances also occur as a result of poisoning y alcohol and drugs such as hashish (*Cannabis indica*), ad, and mercury.

The Toxic Factor.

These disorders of mind, occurring in febrile proesses, cannot be due solely to febrile disturbance ; e toxic factor must be taken into account. We ust persist in the inquiry as to whether certain of e insanities, of everyday occurrence and of unknown igin, and which, prima facie, appear to be of toxic igin are, in fact, ascribable to exogenous or endoenous toxins. To seek experimental evidence which ould establish the presence of a toxin as the cause any variety of mental disorder of unknown origin a sobering experience, although some people seem be on terms of familiarity with the toxins of the ychoses, especially as regards the toxins hailing om the bowel.

The evidence furnished by the morbid histology the brain in the acute and recent psychoses is not favour of anything approaching a virulent toxæmia, ith the possible exception of the condition known "acute delirium" or "acute delirious mania." either clinically (temperature, pulse, respiration) is ere definite evidence of a febrile process. Yet, certain drugs are toxins, able, though not virulent, produce very definite mental disorder, whilst capable of producing the bodily disturbance sociated with a specific fever, so unknown proteins their derivatives may function as toxins and cause me of the psychoses, and be responsible for such anges in the brain as the microscope reveals. We ust look to biochemical research to help us in e supremely difficult problems of perverted etabolism.

[Dr. Goodall then gave a survey of the results of ork in examination of blood, urine, cerebro-spinal uid, and fæces, and continued as follows :]

The observations recorded are not in favour of a eory of toxæmia, referable to the action of intestinal cteria, as a cause of the acute mental disorders investigated. But regard must be had to the great labour involved in this kind of work, and therefore the need for many workers, to accumulate results on a large scale. And better methods for detecting and cultivating intestinal organisms may come to our aid. As to this, reference may be made to articles in The Lancet of July 15th, 1922, p. 127, and the *Journal of Mental Science*, of January, 1923, by Dr. Chalmers Watson, upon the intestinal flora as revealed by the use of a new culture-medium. Ford Robertson in his writings describes several cases of psychoses in which he found an abnormal intestinal flora. Constipation, stercoral retention, toxæmia, acute psychosis—this is the order of events, according to the expounders and the scribes. They can point to the remarkable effects sometimes produced by free purging upon the psychoses, and upon the psychical ebullitions of many persons outside asylums and of the chronic insane in them. But the factors operative, the mode of operation, the links in the chain—in regard to all these, our information is rudimentary. The hardihood which permits of the continued references to an alleged undue occurrence of "indican" (potassium-indoxyl sulphate) in the urine, pointing to auto-intoxication from the bowel, is astonishing, and betrays ignorance of the valuable work done by Stanford (1910–1912) in the Chemical Laboratory at the Cardiff City Mental Hospital.† Stanford's findings still hold good. No value attaches to the so-called "indican" evidence of intestinal toxæmia.

Is there satisfactory evidence that disinfectants, such as izal, kerol, dimol, when given by the mouth favourably influence mental disorders of any kind? I am not aware of any. I have personally tried various disinfectants for years. Recently 11 cases of acute and recent mental disorder (melancholia, confusional states, delusional states), and one of chronic hypochondriasis, were treated with dimol in powder form, four of them receiving 8 gr. of the powder and eight 12 gr. of the same, thrice daily (1 part of dimol in 3 parts of the powder), in most cases for several weeks or months. Five other similar cases were given one kerol capsule thrice daily for like prolonged periods. It cannot be said that any dramatic or decisive results were observed in cases which improved or recovered. Nevertheless, in my opinion, such drugs are worth extensive trial for long periods, preferably combined with lavage of the whole large intestine.

In connexion with the subject of bacteria as factors, through their toxins, in determining mental disorders, the observations of Ford Robertson, as recorded in his work on therapeutic immunisation—and in his paper published in the *Journal of Mental Science* of January, 1922, which deals with the special case of dementia præcox—should be studied. Here I can do no more than indicate his main conclusions. According to him, there would appear to be several types of neurotoxic bacterial infection to which the cortical nerve-cells of patients with predisposition to mental disorders show extreme sensitiveness. Three forms of infection are especially prominent—viz., by aerobic and anaerobic diphtheroid bacilli (first and foremost), by pneumococci, by anaerobic streptothrices of the intestines. *Streptococcus pyogenes* and *Streptococcus fæcalis hæmolyticus* also play a part. The bacterial actions are mostly exercised through toxins carried from foci of infection in the alimentary, respiratory, or genito-urinary tracts. Diphtheroid bacilli have frequently been cultivated from the blood in cases of acute toxic insanity and general paralysis. The pathogenic action of these organisms is demonstrated by focal reactions, by hypersensitiveness to autogenous vaccines, by the success of therapeutic immunisation in relieving symptoms, and by the comparative paucity or complete disappearance of the bacteria upon repetition of the bacteriological examination when the patient had recovered partially or completely.

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* This address will appear in full in the Journal of Mental ience, October, 1923.

† Published in the Zeitschr. f. physiologische Chemie (Bände 87, H. 3, and 88, H. 1).

Although, as far as my reading goes, very little notice has been taken of Ford Robertson's work in either English or foreign literature, my opinion is that this work cannot be ignored, and should be repeated on the lines indicated by him. This would involve bacteriological examination by aerobic and anaerobic methods of the naso-pharynx, of the stools, and of the urine, using, amongst other media, the hæmoglobin-agar introduced by Ford Robertson and Orr, a medium which is very rarely employed. The extensive work of Cotton and his associates on focal infection in mental disorders is an additional argument for the cultivation of this field of research. Amongst sites of focal infection are the teeth, tonsils, naso-pharynx, gastro-intestinal tract, and genito-urinary tract. The improvement in mental disorders recorded as following removal of sources of infection, and vaccination with organisms found, is clinical evidence, at any rate, of toxæmia.

Time will not allow me to deal further with this portion of my theme. I content myself with drawing attention to an observation recorded by Scholberg and myself. In the wash-out (with normal saline) of the fasting stomach in cases of insanity at adolescence (many of these of the dementia præcox group) we found pus cells in a very large proportion—about 60 out of 68 cases. I understand from Dr. H. A. Scholberg, who is pathologist to the Cardiff Royal Infirmary and to the Cardiff Mental Hospital, that these are not found, in his experience, amongst the usual infirmary patients, apart from instances of lesions of the gastric mucosa. This would appear to dispose of the decayed-teeth hypothesis. Possibly some focus in the naso-pharynx was the original source of these pus cells. The matter is at present obscure.

TOXICITY OF BLOOD, CEREBRO-SPINAL FLUID, AND URINE IN MENTAL DISORDERS.

The following summary of information bearing upon the question of the toxicity of the blood, cerebro-spinal fluid, and urine of cases of mental disorder may be recorded. In the course of experimental work done personally or in conjunction with co-workers (Drs. Scholberg and Cameron), a very large number of rabbits and fowls have been injected with blood serum, or blood corpuscles, or the stroma of such, from all the main clinical varieties of insanity, including cases of violent mania, profound melancholia, dementia præcox in its various forms, epilepsy, and dementia paralytica. The losses of weight and the deaths resulting from injections with serum and blood corpuscles were fully equalled by those observed in control animals injected with the like from healthy blood; so that effects a priori ascribable to a toxic cause were, in fact, not due to such. In the case of injection with the stroma of r.b.c., whilst heavy death- and loss of weight-rates obtained in animals injected from the cases of acute insanity, there were no losses and no deaths in the case of those injected with control blood. On this point further experience is necessary.

The small proportion of deaths in fowls compared with rabbits (serum used in both) argues greater resistance in the former. Contrary to what has been affirmed, we did not find the fowl a better precipitin-producer than the rabbit.

Meyer's experiments upon toxicity of the blood of epileptics show the need for further research on the point, and preferably with animals higher in the scale than those used by him. Ten of 11 guinea-pigs injected intraperitoneally with 10–15 c.cm. of defibrinated blood from normal persons showed no symptoms. The eleventh died after convulsions. Of ten guinea-pigs injected with blood removed during an epileptic seizure, nine had typical tonic clonic convulsions in from 1 to 5 hours after injection. Blood removed in the interval between fits affected the animals according to the time elapsing since the last seizure and to the severity of the disease. Preda and Popea (cited by Barbé) state that the serum of epileptics is not toxic for man. Cuneo has recently described a research by which he has obtained from the blood serum of epileptics albumoses, which, injected intravenously into dogs, produce the characteristic phenomena of convulsive seizure. He ascribes epileptic seizures to the action of these albumoses. His paper describes the mode of formation of these substances in the blood of epileptics. Loewe found that the dried insoluble portion of the adialysable substance of urine is, in the katatonic type of dementia præcox, in dementia paralytica (after seizures), and in delirium tremens, highly toxic. In epilepsy it is, in addition, capable of producing seizures very like epileptic ones, injected intravenously. Similar adialysate from the urine of normal persons is not toxic. I consider that further work requires to be done on this subject of toxicity of the body fluids, subdural and intraperitoneal injections being employed.

CHANGES IN THE LEUCOCYTE COUNT.

The existence of leucocytosis in toxic conditions has naturally led various workers to seek for evidence of toxicity in the psychoses as shown by quantitative and qualitative changes in the leucocyte count. I would summarise present knowledge in regard to the leucocyte count in those mental disorders in which it has principally, if not wholly, been investigated as follows:—

Insanity of Adolescence (*Dementia Præcox*).—In the earlier phases there is a moderate increase in the total white-cell count, with relative increase of the neutrophiles. Thereafter, in marked exacerbations of the morbid processes, these increases are more pronounced. The progress towards dementia is characterised by a relative lymphocytosis, with a low total count. There is not sufficient evidence of differences—quantitative or qualitative—in the cell counts in the different forms of dementia præcox.

Insanity with Epilepsy.—There is a considerable degree of accord between observers, the results showing leucocytosis and polynucleosis with hypo-eosinophilia in connexion with seizures, uncharacteristic conditions obtaining in the intervals.

Mania—Melancholia.—A high total count, with relative neutrophile increase at the onset; these subside as the disease progresses; perhaps a second minor increase accompanies symptoms of recovery. The persistence of this, with a normal percentage of neutrophiles after recovery, is a favourable sign (Bruce). A fall in the neutrophile percentage without mental improvement is an unfavourable sign (McDowall). In unfavourable cases the counts are variable, and lymphocytosis becomes apparent with the lapse of time. In subacute and chronic conditions, lymphocytes predominate (Klippel and Léfas).

More evidence is required as to subacute and long-lasting cases, and as to the count at the stage when it is apparent that recovery is to take place. Whilst statements as to isolated occasional white-cell counts in acute mania and melancholia are pretty frequent, it is remarkable how few have conducted inquiry in these conditions over long periods. This criticism, as I have indicated, applies to the cell counts in the psychoses generally, but one would have thought an exception would have been made in cases of the particular kind just discussed, conveying strongly as they do, the impression of toxic pathogenesis. In puerperal insanity the leucocyte count resembles that of acute mania.

States of Acute Confusion.—Leucocytosis: polynuclear increase (both moderate); hypo-eosinophilia; these pass away with decline of the illness and recovery.

Dementia Paralytica.—In the first stage moderate leucocytosis with relative neutrophile increase; in the early second stage, these conditions continue, but in the later second and in the third stages, whilst the moderate leucocytosis is maintained, the lymphocytes, small and large, are relatively increased at the expense of the neutrophiles. A relative polynucleosis, with frequently only a slight increase in the total count, accompanies the febrile attacks of the later stages.

lso the paralytic seizures. In states of remission and f marked quiescence there is a relative lymphocytosis, eplaced by polynucleosis on the occurrence of xacerbations. The evidence furnished by the leuco- te count in the psychoses dealt with is in favour of oxæmia, not a grave form of it.

The observations of Pfeiffer and de Crinis, published 1913, relative to the increase of anti-proteolytic ubstances (as brought out by the antitrypsin test) the serum of cases of the "organic" as dis- nguished from the "functional" and constitutional sychoses, are borne out by Bolten's observations, nade in 1918, but still require confirmation. In case f confirmation it remains that the nature of the anti- ryptic substances (so-called "defence-ferments") is nknown. More work appears to have been done on he continent with Abderhalden's method, which is eclared to demonstrate the presence in the serum of rotective ferments against break-down products of arenteral protein—e.g., from the cerebral cortex, enital glands, &c. These ferments are stated to be resent in cases of dementia paralytica and dementia ræcox, but not in "functional" and "constitutional" sychoses—e.g., manic-depressive, paranoia. These ndings are still in dispute. The latest work with which I am acquainted is that of Ewald, to which would refer those interested.

EFFECTS OF INTERCURRENT MALADIES ON MENTAL DISORDER.

Efforts to ameliorate or cure mental disorder rompted by the observed effects in these direc- ions of intercurrent maladies are familiar to s all. They are sometimes dramatic. Probably yphoid, erysipelas, and malaria are most efficacious, ut pneumonia is also potent, as is also a septic nfection. A febrile reaction is not an essential factor n the production of improvement or cure of the nsanity. I should say that mania, melancholia, onfusional, and stuporose states are chiefly benefited y intercurrent disease. Intercurrent disease may ring about remarkable remissions in dementia aralytica; remissions of extraordinary length are ecorded.

The attempt to imitate the effect of intercurrent lisorders by the subcutaneous injection of nucleinic cid, or sodium nucleinate, dates back to about 1909. Sodium nucleinate was probably chosen because of its bility to produce a decided leucocytosis. Recently "phlogetan," a substance stated to be a derivative of lbuminoid bodies containing nucleo-protein from ell-contents, has been employed by Fischer and thers as being more intensive in action than nuclein. The work of these authors shows that a leucocytosis esults from these injections, and, in my experience, with sodium nucleinate the injection results in eucocytosis with a considerable proportionate rise in he neutrophile count. The pulse-rate was increased n my observations, but rise in temperature was not narked. Having regard to the results recorded by he above workers in cases of dementia præcox, and y others in psychoses with indications of a toxic rigin, one would have thought that this treatment, ssociated with the use of colloidal metals, which also roduce leucocytosis, with increase in the neutrophile ercentage, would have been more persistently and xtensively tried.

From a paper published by Gerstmann in 1922, it ppears that the Vienna School, under Prof. Wagner-Jauregg, who instituted the treatment, is still systematically carrying out the treatment of dementia aralytica by the subcutaneous injection (accompanied r not by scarification) of the parasite of tertian gue into the patient. After 8 to 12 pronounced nalarial attacks, treatment by quinine and neo-salvarsan is instituted. I would refer you to the rticle which I cite for an account of the successful esults (in respect of production of remissions) chieved; also one by Wagner-Jauregg in the *Journal f Nervous and Mental Disease* of May, 1922, and one y Pilcz in THE LANCET of Jan. 6th, 1923, p. 19. This herapeutic measure is also favourably reported upon by Gans. This treatment of dementia paralytica, with a view to production of remission, by the inoculation of patients with blood taken from patients shortly before a malarial attack, or blood of mice which had been inoculated from a case of relapsing fever—the mental cases being inoculated either subcutaneously or intravenously—is also being carried out at the Hamburg Psychiatric Clinic and the results up to date (1922) are fully reported upon by Kirschbaum. I would suggest that a reaction with production of anti-substances to the spirochæte of relapsing fever, or even to the *Plasmodium malariæ* (a protozoon), might theoretically be expected to be more efficacious in dementia paralytica than any reaction as a result of inoculation of bacilli, since the above organisms are biologically more closely related to the spirochæte of syphilis. Stimulation of the defences by inoculation with the virus of syphilis would seem to be a more rational procedure than the above. According to Scharnke (Marburg) cautious experiments in this direction have long been in progress, though I have not come across any accounts of the results.

The beneficial results of intercurrent maladies, and of the therapeutic measures referred to above, upon the insanities may be examples of non-specific protein therapy. We are far from understanding the rationale of this treatment, and it is unprofitable to discuss the theories advanced on the subject.

It would appear worth while to pursue the inquiry as to the effect of non-specific parenteral protein therapy in mental disorders suggestive of a toxic origin. Any experience available is worth brief record, even though negative; in the latter case, time will be saved to intending workers. I have used a 1 per cent. solution of Armour's peptone, in doses up to 1 c.cm., intravenously. This was sterilised by filtration through a porcelain candle. With it I obtained no physical or psychical evidence of reaction. I would make the suggestion that Witte's peptone, either added to the above or alone, might be tried. The risk of anaphylaxis cannot be dismissed with intravenous injections, and it is doubtful whether they are superior to intramuscular ones.

PRODUCTION AND SPECIFICITY OF ANTIBODIES.

Production of antibodies by inoculation of animals with the sera, red blood corpuscles, or stroma of same, of cases of mental disorder: specificity or otherwise of such. In 1913 I inquired into the point as to whether the blood-serum of the insane produces specific precipitin when inoculated intravenously into rabbits. The results were estimated by naked-eye observations. From these it was gathered that a given anti-serum produced the same amount of precipitate, whether put up against the actual serum by which it was produced, the serum of patients suffering from the same mental disorder, or the serum of patients suffering from other kinds of insanity. There was no specificity of reaction. There is room for further work in this direction, an agglutinoscope, or even a low power of the microscope, being employed in reading the results. In 1921–1922 further work on the same subject was done by Dr. Scholberg, Dr. Cameron (of Cardiff), and myself. Red blood corpuscles, or the stroma of such, were used as antigens, in addition to serum. The same lack of specificity was noted. Interesting is our failure to produce antibodies (as tested against c.s.f. of G.P. and non-G.P.) by the injection into rabbits of large amounts of cerebro-spinal fluid from G.P.'s, and choroid-plexus emulsion, from cases of dementia paralytica, and control-plexuses from other kinds of disease. In conjunction with Scholberg and Cameron I have entered into the question of production of specific anti-substances by the injection into animals of the serum, whole red blood corpuscles, or stroma of such, from cases *recently received* of acute mental disorder. The argument was that if these acute and recent states had been produced by an unknown toxin, such would have produced antibodies in the patient's blood, which, in turn, might be expected to evoke anti-substances when injected into animals. It was found, however, that such anti-substances as were produced were not specific, but reacted as much with a control's blood as with that of the patient from whom the injections were made. The antibodies looked for were precipitin, hæmolysin, and hæmagglutinin; there is room for further research as to complement fixation.

An inquiry was made by us as to whether the psychoses, or any of them, could be classified in the four blood-groups of Moss, who placed human beings in four groups, according to the ability of their serum to cause agglutination, and of their corpuscles to be agglutinated. According to Moss, agglutinins appear with approximately the same relative frequency in health and various diseases, and have no diagnostic significance. Therefore, it was not surprising that we found, having examined 262 cases, that instances of various kinds of mental disorder occurred in each and any of the groups, and that, therefore, the psychoses are not classifiable in these groups.

It still remained of interest to inquire—irrespective of the question of insanity—whether the precipitin, hæmolysin, or hæmagglutinin, produced in the serum of rabbits or fowls by inoculation of serum, or blood corpuscles, or their stroma from cases in a given group, gave a greater reaction with antigens (serum or r.b.c.) of that group than with those of another group. In respect of the two groups (1 and 4) dealt with, a large number of tests showed that there was *no group-specificity*. Fowls were injected intravenously and intraperitoneally, in the first case with repeated doses, in the latter with one large dose (20 c.cm.), only serum being injected. Rabbits were injected intravenously with repeated doses of all the antigens in question. An interesting point, meriting further investigation, emerged in the course of this experimental work; it was found that the anti-serum against stroma of red blood corpuscles produced, with the red blood corpuscles tested, agglutination much more frequently, or more strongly, than anti-serum obtained by injection of whole red blood corpuscles.

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(*Continued at foot of next column.*)

BRONCHOMONILIASIS.

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Only within recent years has there been any general recognition of the frequency with which mycotic infections of the respiratory tract occur. In 1910 Castellani[1] drew attention to the part played by fungi of the genus Monilia, and published an account of 22 cases occurring in Ceylon. Since that time numerous other instances have been recorded, notably in Egypt,[2] Italy, and South America.[3] Cases have also been found in Siam,[4] China,[5] South Africa,[6] France, and elsewhere. In general it may be said that the maximum incidence occurs in climates which are both hot and moist. Fungi of the Monilia group are members of the family Oösporaceæ, to which class belong those of the closely allied genus Oidium. Outside the body they are widely distributed, and may be found more especially on fruit and on dead leaves and wood. In the sputum they appear as round or oval Gram-positive, yeast-like bodies, sometimes showing a double contour (Fig. 1). Fragments of mycelium may also be found, often in bacillary or coccoid forms. Not infrequently tiny white particles, representing masses of growth, may be visible to the naked eye.

Although cultures may be obtained on ordinary media, a more copious growth occurs in those which are slightly acid in reaction and contain a percentage of some sugar—e.g., glucose or maltose. Growth occurs readily at room temperature, but in some cases is more rapid at 37° C. On solid media (Fig. 3) the cultures are usually of a creamy-white colour; later, a brownish pigmentation often appears. They are composed of the yeast-like bodies only. In liquid media, bacillary and filamentous forms may be found (Fig. 2). Numerous species have now been isolated. For their identification, use has been made of their powers to ferment various "sugars" with the production of gas. Castellani has demonstrated that these powers are remarkably constant in freshly isolated strains, and on this basis has evolved a comprehensive classification.[7]

Infection in Man.

In man direct infection from case to case may possibly occur. More commonly, however, bronchomoniliasis results from the inhalation of contaminated particles. The relatively high incidence among tea-tasters in Ceylon confirms this view, and gives some indication of the importance of the occupational factor. The further possibility that pulmonary infection may occur by spread from a cutaneous source is suggested by the researches of Wade,[8] who succeeded in producing chronic lesions with cavitation in the lungs of a monkey after subcutaneous injection of a broth culture of *Blastomyces dermatitidis*. It is noteworthy that in cases of primary infection of the respiratory tract the mouth and pharynx usually escape. Secondary infection from this source may, however, occur in debilitated persons. Instances of mixed infection are not uncommon, notably with the tubercle bacillus or, in tropical countries, with *Spirochæta bronchialis* or *Paragonimus westermanni*.

(*Continued from preceding column.*)

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Clinical Features.

Clinically, all grades of severity are to be met with. the milder cases the general health is not seriously ıpaired, and there is very little fever. Physical amination reveals signs of bronchitis, or perhaps of oncho-pneumonia. In the more severe instances asting is marked, and may be accompanied by all the gns and symptoms usually associated with pulmonary berculosis. Intermediate types are not uncommon ıd may run a prolonged course with one or more lapses.

Post-Mortem Findings.

As the majority of cases recover, post-mortem cords are scanty. It would appear, however, that the itial lesion is a bronchitis, from which extension may cur with the production of an acute or chronic oncho-pneumonic consolidation. In some instances rcumscribed tubercles may be found. Mendelson,[4] escribing a chronic case in which death occurred from tercurrent disease, states that the lungs were firm ıd contained numerous white nodules resembling ıose found in tuberculosis—except for the fact that ıey showed no sign of breaking down. Boggs and incoffs[9] record a further case, complicated by the resence of carcinoma mammæ in which abscesses bove and below the left clavicle communicated ırough numerous small openings in the thoracic all with a localised empyema beneath it. The left ıng was densely adherent to the chest wall. Its pper lobe was solid, firm, and grey. In the lower be were scattered areas of consolidation, especially the apex. The bronchi showed evidence of inflam- ation, and the hilus glands were enlarged and con- ined translucent areas. A third case, complicated y pulmonary tuberculosis, is reported by Macfie nd Ingram.[10] A pyo-pneumothorax was present n the left side, and contained thick creamy pus. umerous tubercles were present in both lungs, any of them caseating. Tubercle bacilli were emonstrated in the lungs; in the pleura both ıbercle bacilli and *Monilia tropicalis* were present. hese two organisms had been found in the sputum ı large numbers during life.

Animal Experiments.

Various attempts have been made to induce direct ıfection of the respiratory passages of animals. In 912 Castellani[11] succeeded in producing broncho- neumonia in a guinea-pig as the result of repeated ısufflations of tea-dust. In 1915 Boggs and Pincoffs[9] btained lesions in the lungs and other viscera of abbits as the result of injections of pure cultures of Ionilia into the trachea. Insufflation experiments arried out on monkeys by Chalmers and MacDonald ailed to give clinical results.[2a] The subcutaneous oute has also been utilised. Using pus and sputum, 'arah[2b] obtained negative results, and with broth ultures only succeeded in producing a local indura- ion in rabbits. Intraperitoneal injection, however, esulted in a brisk general reaction followed by ecovery; intravenous administration invariably pro- uced disseminated lesions, notably in the lungs nd kidneys, and resulted in death within a few days. 'his last observation has been confirmed by many bservers.

With regard to these experiments, which are eported to have given negative results, it is of ıterest to note that Mendelson[12] succeeded in nding areas of consolidation and small non-caseating odules, together with enlargement of the bronchial lands in guinea pigs, which failed to show any clinical isturbance, even after the lapse of several weeks fter inoculation.

It seems to be fully established that lesions produced y various species of Monilia are indistinguishable rom each other. Using cultures of *Monilia pinoyi* solated from Case 2, we have obtained the following esults in rabbits:—

1. As the result of intravenous injection of 5 c.cm. of a noderately turbid emulsion, one rabbit died after three days; second, obviously ill and rapidly losing weight, was killed on the eighth day. In both, numerous miliary lesions resembling tubercles were found in the organs, especially in the lungs, liver, spleen, and kidney (Fig. 4). Cultures made from these yielded a pure growth of *Monilia pinoyi.* Sections showed the presence in them of both oval and filamentous forms of Monilia in large numbers. In all the organs the perivascular distribution of the lesions was very noticeable. In the lung there was also evidence of peribronchial infiltration.

2. Intratracheal injection of similar emulsions produced no gross clinical symptoms apart from a slight cough. This rabbit was killed after eight months. The only macroscopic lesions found were small scattered patches of consolidation in the lungs. In sections, apart from the consolidation, marked peribronchial infiltration could be seen (Fig. 5), and small tubercles composed chiefly of endothelial and plasma cells and having hyaline non-caseating centres.

In the consolidated areas the arteries showed very obvious thickening.

Cases.

The following cases may be of interest in that their nature was discovered in the course of routine investigation of patients in this country. The first occurred in the private practice of one of us (Th. J.), the others among patients admitted to St. Bartholomew's Hospital.

CASE 1.—A married woman came under the observation of one of us (Th. J.) in April, 1920, suffering from an illness which presented all the clinical features of pulmonary tuberculosis. For two years she had been troubled by cough and the expectoration of muco-purulent material, at times blood-stained. Fever was present, accompanied by sleep sweats and progressive emaciation, and weakness which had for some time confined her to bed. Well-marked signs of consolidation were present at the apices of the lungs. A curious feature of the case was the fact that, although the sputum had been examined on no fewer than 17 occasions tubercle bacilli had never been found. A fresh specimen was obtained, and in it were seen numbers of tiny white masses, which proved to consist of yeast-like bodies of which large numbers were visible in films. No tubercle bacilli were seen. Cultures from this and from subsequent specimens on Sabouraud's medium yielded a profuse growth of Monilia (untyped).

As a result of these findings increasing doses of potassium iodide were given. The effect was most marked. The general condition improved rapidly, and within two months the patient was able to get up and to walk about. She was seen again at the end of a year, and appeared to be in perfect health.

This case illustrates how chronic may be the course of the infection, and how readily the condition may be confounded with that of pulmonary tuberculosis.

CASE 2.—A man of 32 was admitted under the care of Dr. H. H. Tooth in December, 1920. He had for the past two years been engaged in unpacking syphons sent from Austria, in dirty and dusty straw. Both he himself and his fellow workers frequently suffered from pustules on the exposed parts of the arms and face. About ten days before admission he developed a slight cough with scanty expectoration. This gradually increased in severity and became associated with fever and malaise. Herpes labialis was present on the left side. The fauces were red and injected, and there were signs of consolidation at the base of the right lung—signs which did not wholly disappear until a month later. The spleen was just palpable. The temperature began to fall on the eleventh day after the onset of acute symptoms, and reached normal by lysis. Thenceforward convalescence was rapid, interrupted only by an acute follicular tonsillitis in the fourth week.

The sputum, at first scanty, later became more copious; it was muco-purulent and free from blood. Numerous small white specks were visible in it. In films were seen numbers of oval Gram-positive bodies, and numerous bacillary and filamentous forms. Cultures on Sabouraud's medium yielded a copious growth of *Monilia pinoyi.*

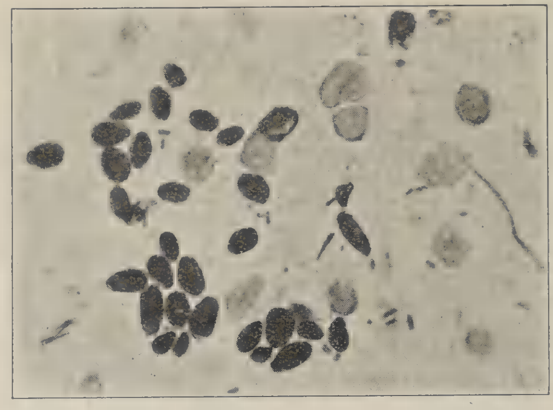
When last seen, some six weeks after admission, the patient was in good health and free from cough. Monilia was still present in the sputum, though in smaller amount than previously.

CASE 3.—A girl of 16, a cigarette packer, came under Dr. Tooth's observation in March, 1921, with signs of bronchopneumonia at the base of the left lung, which persisted for three weeks. The onset was sudden, accompanied by cough and by a considerable rise in temperature, which fell to normal by lysis on the sixth day. As in the previous case, convalescence was interrupted by an acute tonsillitis with exudation occurring in the fifth week. The sputum was copious and frothy at first; later it became more scanty and tenacious. In films were numerous Gram-positive diplococci and filaments. Culture yielded a growth of pneumococci (type 2) and of *Monilia pinoyi.*

The patient was last seen ten weeks after the onset of her illness. She was in good health, the amount of sputum was very small, but still contained Monilia.

CASE 4.—A woman of 47, a needleworker, was admitted to hospital under the care of Dr. Tooth in April, 1921, complaining of malaise and obscure pain in the right side of the chest. An area of consolidation was present at the base of the right lung, over which coarse pleural friction was audible. A few days later a further area of consolidation appeared at the base of the left lung. Recovery was gradual and uninterrupted. The temperature remained raised for 14 days, and fell to normal by lysis. The signs of consolidation, however, did not wholly disappear for some weeks.

FIG. 1.

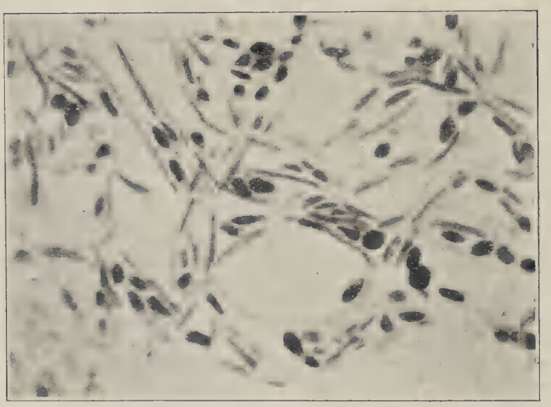


Fungi of Monilia group in sputum, appearing as round or oval yeast-like bodies.

The sputum in this case was never copious. Repeated cultures on Sabouraud's medium yielded a plentiful growth of *Monilia guillermondi.*

CASE 5.—A girl of 15, a blouse machinist, was admitted to hospital in May, 1921, under the care of Dr. Tooth, suffering from cardiac failure, following a recent attack of rheumatic fever. She was febrile, and coughed up a moderately large amount of muco-purulent sputum, from which a profuse growth of *Monilia pinoyi* was obtained on several occasions. Signs of consolidation were present at the base of the left lung. After a few days generalised râles and friction at the base of the right lung appeared. Later 28 c.cm. of clear, sterile, straw-coloured fluid were removed by aspiration from the left pleural cavity. The patient's cardiac condition failed to improve. She died two months after admission. Autopsy revealed the presence of severe lesions in the heart. There was a small amount of fluid in both pleural cavities The lungs were very œdematous but otherwise normal.

FIG. 2.



Bacillary and filamentous forms found in liquid media.

Unfortunately, no detailed examination was mad for evidence of Monilia infection.

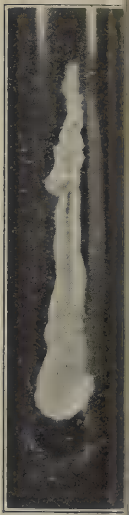
The following case is an instance of mixed infectio with Monilia and the tubercle bacillus, and is o interest because, as the diagnosis of phthisis appeare clear, the sputum was included in the number of tha examined as controls.

CASE 6.—A housewife, aged 24, was admitted in December 1921, under the care of Sir Thomas Horder. She had bee in poor health for four months, during the last of which sh had been confined to bed, and had lost weight rapidly Cough was troublesome, with expectoration of much muco purulent material. On several occasions examinatio showed the presence of large numbers of tubercle bacilli, o pneumococci, and also of *Monilia pinoyi*, both in yeast-lik and filamentous forms. The patient remained under observation for two months, during which time her condition steadil deteriorated.

Although it would appear that the various specie of Monilia are widely distributed, records of publishe cases give some indication of the local predominanc of certain of them—e.g. *M. pinoyi* in Egypt an *M. tropicalis* in Ceylon. It is interesting, therefore to note that from four out of five of the cases abov recorded *M. pinoyi* was isolated. In only two of the cases (2 and 3) does the influence of a dusty occupation as to cause of infection seem to be at all possible. In Case 2 the history of the occurrence of pustules on the arms and faces of workers seems suggestive. Attempts to isolate Monilia from a sample of the suspected straw (Case 2) and from the dust of various brands of cigarettes (Case 3) failed.

The clinical picture in no way presents any distinctive feature. The long duration of the signs of pulmonary consolidation is notable, as is the persistence of the fungus in the sputum after the completion of convalescence—a feature indicative of the chronicity of the infection, and perhaps of the possibility of relapse. In the two cases which presented an acute tonsillitis cultures made from the exudate yielded a plentiful growth of *Monilia pinoyi*. It is difficult, however, to exclude the possibility of contamination from the sputum.

FIG. 3.



Creamy-white culture on solid media in test-tube.

Diagnosis.

The diagnosis of bronchomoniliasis is by no means free from difficulty. It depends primarily on the repeated demonstration of the fungus in the sputum. It is essential that specimens should b collected into sterile vessels and washed repeatedl before cultivation. The patient should gargle wit sterile saline or with a dilute solution of potassiu permanganate before expectorating. In cases o true infection a profuse growth occurs fro cultures on Sabouraud's medium. In other case experience has shown that, even when the preliminary washing of the patient's mouth is neglected it is exceptional to obtain more than a very scant growth, and that commonly none at all appears This fact has been established by the examinatio and cultivation of a large number of sput selected at random without reference to the clinica diagnosis. Confirmatory evidence may be sought i other directions.

(*a*) Fixation abscess: In Case 2 the hypodermic administration of digitalin resulted on three occasions in the productio of small abscesses containing *Monilia pinoyi* in pure culture This fact was interpreted as an indication that a true an generalised infection existed. As a further step, smal fixation abscesses were produced in Cases 3, 4, and 6 by mean of the hypodermic injection of a few minims of oil of turpentine. In Cases 3 and 6 the pus was sterile. In Case 4

However, Monilia was demonstrated in film and grown in pure culture. It would appear, therefore, that this procedure is of some diagnostic value.

(*b*) There is no record in published cases of resort to blood culture. In view of the possibility of generalisation of the infection, positive results might be expected in some instances. Cultures in sugar-broth media taken from Cases 2 and 3 of the above series proved sterile.

(*c*) Agglutination and complement-fixation tests are sometimes of value. No evidence of the presence of specific agglutination could be found in the sera of Cases 3 and 4, although after the administration of an autogenous vaccine agglutination occurred in Case 2 in serum dilutions from 1 in 5 to 1 in 50.

(*d*) In Cases 5 (*M. pinoyi*) and 4 (*M. guillermondi*) an attempt was made to establish the diagnosis by means of cutaneous inoculation of protein isolated from a culture of *Monilia pinoyi*. In neither instance did any reaction occur.

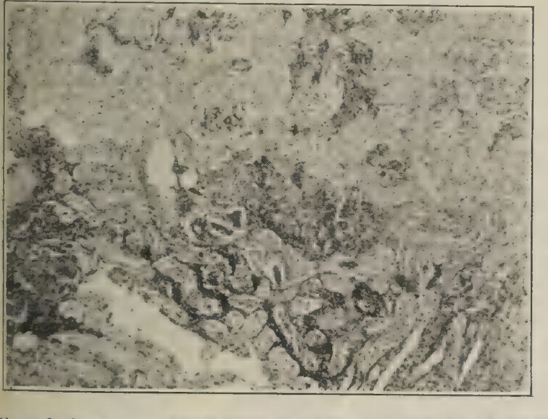
In those cases where the lesion is purely local those methods of investigation which aim at the detection of the organism in the circulation, or which depend on the recognition of specific general reactions, are hardly applicable. There is, however, evidence to suggest that dissemination does occur and that the use of these methods for diagnostic purposes is worthy of trial.

Treatment.

Authorities are unanimous in their opinion that the administration of iodine is beneficial. For oral administration potassium iodide in large doses is sometimes effective, although tinct. iodi. (French Codex) is perhaps a more active preparation. Castellani recommends saiodin (10–20 gr. t.d.s.) in cachet. For intramuscular injection lipiodol in doses of 1–2 c.cm. (0·54–1·08 g. iodine) daily is of use.

In the cases recorded above potassium iodide was administered in doses of from gr. xxx.–lx. per diem. The persistence of Monilia in the sputum after convalescence is due in part to the fact that the patients neglected treatment, and in part no doubt to the relative smallness of the doses ordered. Cases 2 and 4 were given autogenous vaccines in doses of from 10–2000 millions. No reaction of any kind was observed.

FIG. 4.



Miliary lesions resembling tubercles found in kidney of rabbit after intravenous injection of 5 c.cm. of a moderately turbid emulsion of *Monilia pinoyi* culture isolated from Case 2.

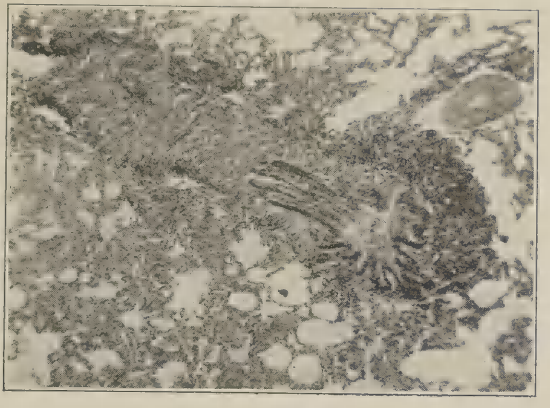
Prognosis.

Mild cases tend to recover spontaneously. There seems to be no doubt, however, that efficient treatment is capable of considerably modifying the course of both the mild and the more severe infections, and of producing a rapid improvement in many cases. To avoid, as far as possible, the danger of relapse, the patient should be kept under the influence of iodine for some time after convalescence is complete.

Conclusion.

In conclusion, it is suggested that bronchomoniliasis is of more frequent occurrence in this country than has hitherto been suspected, and that, as the clinical features are in no way distinctive, the investigation of sputa for the presence of fungi will well repay the trouble entailed.

FIG. 5.



Section of rabbit's lung showing marked peribronchial infiltration and small tubercles, composed chiefly of endothelial and plasma cells and having hyaline non-caseating centres.

We wish to thank Dr. H. H. Tooth and Sir Thomas Horder for permission to investigate and to publish these cases and, more especially, for the kindly interest which they have taken in our work.

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MENTAL TESTS FOR DELINQUENTS,

AND MENTAL CONFLICT AS A CAUSE OF DELINQUENCY.

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THE first part of this paper deals with the results obtained with the Hamblin Smith scheme of tests[1] on prisoners in Birmingham Prison. Of 750 cases tested during a period of three years, only those have been considered for the purposes of this paper in which a complete examination with these tests was given. This condition has excluded, amongst others, a considerable number of imbeciles. Of these completely examined cases there were 217 men and 108 women. It must be taken into consideration that there were a number of cases remitted for special investigation under the Birmingham scheme,[2] and many of these were prima facie abnormal. No conclusions, therefore, must be drawn from our figures as to the percentage of mental defectives and subnormals amongst our criminals.

Examination of 325 Cases.

The results arrived at after the examination of these 325 persons suggest conclusions which further investigation on a more extensive scale is needed to corroborate. We are, therefore, presenting suggestions and indications rather than statistics. The cases have been grouped under the headings of normal (N), subnormal (S), and mental defective (M.D.). (Table I.)

TABLE I.

	N.	S.	M.D.
Males	106	46	65
Females	45	22	41

Note.—This table must be kept in view throughout. All percentages throughout the paper are calculated on the basis of the figures here given.

The *normal* group needs no special description. The *subnormal* group consists of : (1) Persons considered to be defective in intelligence, in whom the defect is not great enough to warrant placing them in the mentally defective class, or where there was difficulty in establishing the existence of the defect from an early age. (2) Persons in whom the defect in intelligence is complicated by and in some cases brought about by mental conflict. The *mental defective* group are those who are certifiable under the 1913 Mental Deficiency Act—i.e., they present all the criteria of permanent mental defect from an early age, with need for care, supervision, and control for their own protection or the protection of others. Of the total 325 cases all except 28 were under the age of 30 years. The remainder were either subnormal or mentally defective. We have found that mentally normal persons over the age of 30 do not respond well, as a rule, to formal testing. The remaining 297 cases were quite unselected.

The total 325 cases have been classified as under:—

1. Under the headings normal, subnormal, and mental defective : (*a*) Results obtained in each of ten tests, summarised in Table II., are briefly explained and discussed. (*b*) The character of offences committed.
2. The normal and subnormal cases in connexion with mental conflict have been dealt with.
3. A general summing up of the results obtained is given.

Details of Tests.

TEST 1. *Money Change.*—In this test the subject is asked simple questions such as : If your fare on a tram were 2½*d.* and you gave the conductor a 2*s.* piece, what change should you get? If you buy 1 lb. of bacon at 1*s.* 5*d.* the pound, what change should you have out of half-a-crown? "A kind of problem that must be solved if a subject is to live at all in the ordinary world." The gradation is definitely downwards; but it is to be noted that rather more than half the mentally defective are able to pass this test. The normal female shows a slightly better result than the normal male. This is probably due to the fact that women do the marketing and are, therefore, more constantly having to use this form of mental activity than the male.

TABLE II.—*Summary of Results Obtained in Ten Tests*

—	Sex.	N.	S.	M.D.
Test 1. Percentage of success ..	M.	97·8	83·7	54·9
	F	100	80·9	69·2
,, 2. Percentage of success ..	M.	96·2	82·6	56·9
	F.	88·8	77·2	43·9
,, 3. Percentage of success ..	M.	92·5	69·9	38·4
	F.	88·8	45·4	21·9
,, 2 and 3 together. Percentage of success	M.	89·6	58·7	23·0
	F.	82·2	31·8	14·6
,, 4. Percentage found suggestible	M.	44·6	60·9	62·3
	F.	33·3	50·0	52·8
,, 5. Percentage of success ..	M.	90·4	57·7	20·0
	F.	95·5	68·1	20·5
,, 6. Percentage found suggestible	M.	41·7	32·9	65·1
	F.	15·6	31·9	35·0
,, 7. Percentage of superior plan	M.	68·0	39·1	17·5
	F.	53·4	30·0	5·4
,, 8. Percentage of success ..	M.	86·6	64·9	61·2
	F.	89·2	62·1	48·5
,, 9. Percentage of success ..	M.	71·7	30·2	15·6
	F.	51·1	19·0	5·4
,, 10. Percentage of very good, good, or fair	M.	93·0	81·4	20·9
	F.	81·2	66·6	31·0

TEST 2. *First Form Board* (*Healy*).—The board is a rectangular frame into which exactly fit five blocks. It is a test of attention, perseverance, perception of form relationship and the ability to plan a simple piece of work. Again, the gradation is downwards. The males show a better result than the females. Since men are frequently engaged in work such as carpentry, brick-laying, plumbing, van-loading, road-making, &c., all of which require some skill in planning and fitting, it may be concluded that the difference is again, probably, due to occupation. The same variation is evident also in the second form board and in both boards taken together.

TEST 3. *Second Form Board* (*Hamblin Smith*).—This is similar to the first form board test but more difficult, requiring a higher degree of intelligence to accomplish it. As we should expect, the gradation is very much more marked. Where 56·9 per cent. of mental defectives among the males were able to do the first form board, only 38·4 per cent. were able to do the second form board. Among the females the percentage for the first form board is 43·9 as against 21·9 for the second. Taking Tests 2 and 3 together we see that the percentage in the mental defective group is very much lower. The two tests, especially when taken together, form decidedly good discriminating tests for mental defect.

TEST 4. *Aussage.*—A test of attention, observation, memory, and suggestibility. The subject is given a brightly coloured picture, being told to observe carefully all that he sees therein. After 20 seconds the picture is taken away, and he is told to give a full description of everything that he has noticed. After having exhausted these memories the examiner suggests certain objects as having been in the picture, and notice is taken as to whether the subject accepts these suggestions or not. The table shows the percentages of those found to be suggestible. It will be noted that suggestibility rises with the decline of intelligence, also that the males show a slightly greater degree of suggestibility than do the females.

TEST 5. *Interpretation of Pictures* (*Terman*).—This is a test of apperception, recognition of a situation presented visually, and imagination. Two pictures are given in turn to the subject, and he is asked to give an interpretation of their meaning. The descent is very marked, and the test is correspondingly valuable. The females make a slightly better show than the males, perhaps indicating a slightly greater power of imagination.

TEST 6. *Comparison of Lines* (*Binet*).—A test of suggestibility. Three pairs of unequal lines, the longer being, in each case, on the right-hand side, followed by three pairs of equal lines, are presented to the subject in succession. The suggestible subject is liable, because of the repetition in the first three pairs of the longer line being on the right-hand side, to see a longer line on the right-hand side in the case of the equal pairs also. There is a marked increase of suggestibility in the mentally defective class. As in Test 4, the males show a greater degree of suggestibility than the females. This difference may be due to the more secluded e of the female of the type with whom we are dealing d to her more guarded contact with the outer world; e male, who is more accustomed to meet other people, is s suspicious.

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[1] The Psychology of the Criminal, Hamblin Smith, Chapter 2.

[2] The Medical Examination of Delinquents, Journal of Mental Science, July, 1922.

Tᴇsᴛ 7. *Cricket Ball* (*Terman*).—A circle of about inches in diameter, with a gap to represent a gate, is esented to the subject. He is asked to suppose he has lost ball or a purse in this field, and to draw a line from the te indicating the path he would take in order to find the t object. The test is one of ability to grasp essentials, to nprehend simple directions, and to make a plan. The ult may be a superior plan, an inferior plan, or no plan at . Table II. shows the percentage able to produce a perior plan. The descent is very marked and the test ry valuable. Males are better than females, probably the same reasons as in Tests 1 and 2.

Tᴇsᴛ 8. *Apperception Test* (*Heilbronner*).—This consists eight sets of cards, each successive card in the set showing her more detail in the representation of some common ject (lamp, bicycle, &c.), until the complete object is own in the final card. The cards in each set are presented their order, and a note is made of the point at which e subject names correctly the object shown. A success is red when the subject recognises the object in at least e of the eight sets before more than half the cards in each have been shown. Apperception is naturally less strong the subnormals and the mentally defective. The difference tween the sexes is not appreciable.

Tᴇsᴛ 9. *Pictorial Completion Test* (*Healy*).—A test manding mental control, association, imagination, and perception. It consists of a brightly coloured picture, unted on wood, and in which 10 1-inch squares have been out. The subject is given the picture and 45 blocks, each nch square, of which 40 bear a representation of some ject, while the other five are blanks. He is required to in the picture with the blocks which, in his opinion, make e best sense. Care is taken to see that he thoroughly derstands what he has to do by means of the demonation of the correct filling of one space by the examiner. e subject is then left to complete the picture by himself. note is made of final errors, logical and illogical, the latter ng errors for which the subject can give no reasonable planation. The gradation is very marked, and this torial completion forms a most excellent discriminating t. The opinion expressed in "Psychology of the Criminal," 42, that an absolutely complete success in this test cludes mental defect, still holds good. In our present ures, however, we have scored more leniently, allowing vrong window, a wrong bird, and a pumpkin instead of a ll to count as logical and a pass.

Tᴇsᴛ 10. *Information.*—A test of general current knowge, involving simple questions such as the name of the ng and the Prince of Wales, the names of four or five ge cities in England, the cause of the Great War and the te of its commencement, the names of our allies and those Germany, and so on. This table includes cases whose ormation was scored as "very good, "good," or "fair." e results are as expected. There is a great falling off in e mentally defective class. Here, again, the males are tter than the females, a result we should expect, since men, reason of their manifold occupations, are brought in ntact with the outer world, whereas the women of the ss from which we draw our offenders are often occupied at me.

Summing up the results obtained on the ten tests, ble III. shows the averages of failures in each case. ese averages rise rapidly in the subnormal and ntally defective groups.

ʙʟᴇ III.—*Showing Averages of Failures in each of the Tests.*

—		N.	S.	M.D.
les . .	No. of cases	106	46	65
	No. of failures	198	197	552
	Average per person . .	1·88	4·37	8·76
nales	No. of cases	45	22	41
	No. of failures	101	121	333
	Average per person . .	2·24	5·5	8·1

Table III. also shows the averages in the normal d the subnormal classes on the male side to be tter than on the female side. This is what we uld expect, since Tests 2, 3, 6, 7, 8, and 9 give each case a better result for the male, an explanan of which has been suggested on occupational unds. In Tests 1 and 5 the female is better than e male, probably from the same cause. In Tests 4 and 6 it should be noted that the males are more suggestible than the females.

We venture to think that, for reasons set out in detail in the "Psychology of the Criminal," pp. 46-8, this scheme of tests possesses certain advantages over the well-known Terman scheme, as well as avoiding certain possible fallacies, especially for use with subjects between the ages of 16 and 30 years. The tests require little facility in the use of language, and are, therefore, very useful when we deal with the subnormal or defective "verbalist" type.[3]

Classification of Offences.

Classifying the cases under offences, we have divided them into four groups:—

(*a*) *Larceny.*—Offences of dishonesty of every kind, from trivial stealing to obtaining money on false pretences.

(*b*) *Sex.*—The character of offences in this class on the part of the males is largely that of indecent exposure and indecent assault, whereas in the female the offence in most cases is that of solicitation. That is to say, that while in the male the offence is purely sexual in character, in the female the offence is activated largely, and in some cases solely, by economic reasons.

(*c*) *Vagrancy.*—This includes all such offences as begging and wandering without visible means of support.

(*d*) *Miscellaneous.*—A comparatively small group, including drunkenness, violence, attempted suicide, &c.

Table IV. shows the percentages of cases arranged under each group.

Tᴀʙʟᴇ IV.—*Showing the Percentage of Cases arranged under each Group.*

—		N.	S.	M.D.
Males . .	Larceny	68·9	50·0	41·5
	Sex	20·8	21·7	26·2
	Vagrancy	7·2	13·0	21·5
	Other offences	3·1	15·3	10·8
Females	Larceny	52·2	38·1	25·0
	Sex	13·5	28·8	25·0
	Vagrancy	10·5	4·1	27·5
	Other offences	23·8	28·0	22·5

The great preponderance of larceny and sex offences over all others is clearly seen. These two offences will always provide the vast majority of the cases to be investigated.

The Factor of Mental Conflict.

We now take the normal and subnormal groups, and give below in Table V. the percentage of cases in which the offence committed was due to mental conflict. No conclusions, however, as to the incidence of mental conflict as a cause of delinquency must be drawn from these figures, since many of these cases were sent for special observation. Further, some of the cases were not examined sufficiently deeply to ascertain whether mental conflict were present or not. The short period of detention of many of the subjects, as well as on our part the lack of the necessary time, have been obstacles to deeper and more extensive investigation. But we have often gone far enough to see that a mental conflict, deserving fuller investigation, is a prominent factor in many cases. And we feel that mental conflict is the most important single cause of delinquency amongst the normal and subnormal offenders.

Tᴀʙʟᴇ V.—*Mental Conflict Cases.*

	N.	S.
Males	32·0	41·3
Females	33·3	13·6

The figures in Table V. represent altogether 70 mental conflict cases; and these, under the head of offences, are divided up as below: larceny, 50 per cent.; sex, 28·3 per cent.; other offences, 21·7 per cent. In dealing with these cases we have found without exception that the conflict has been of a sex nature, although the offence committed may be of an entirely different character—e.g., stealing, violence, drunkenness, &c. As an example, a woman was brought up before the courts on the charge of wilful destruction of public property; analysis proved the meaning of the act to be an attempt at expression on the part of a repressed complex which had originated in a sex experience many years before. The act was, in fact, an attempt on the part of the patient at protection against her unconscious. It is, moreover, to be noticed that sexual offences in the male, such as indecent behaviour, are, in the female, where repression of sex impulses has been more generally practised, often substituted by other offences, such as violence, attempted suicide, drunkenness, &c.

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[3] Healy: "The Individual Delinquent," pp. 501, ff.

In summing up, therefore, we venture to think that our findings indicate at least one thing—that is, the enormous importance of conflict as a cause of delinquency. We are well aware that there is much that is highly controversial in this subject, and that very diverse views are held as to the precise mechanism and character of conflict and repression, and the manner of its operation. Into this controversy it is not our intention to enter. Nor does it greatly matter, from a practical point of view, which particular theory is adopted. It is the effect of repression and conflict which concerns us. And upon this there is more unanimity of opinion. To take an example from a somewhat cognate subject. There are great divergences of view as to the mechanism of production of dementia præcox; but there is no difficulty in the recognition of well-marked cases of that condition. Nor is there divergence of opinion as to the way in which these cases are to be dealt with. So with repression and conflict. Until such time as the present controversies have composed themselves, it is open to us to adopt any of the varying views. But there can be no doubt as to the importance of the condition. Nor can there be uncertainty as to the desirability of proper psychological investigation and treatment of this condition, nor the failure of our present methods in this respect. And the recognition of the importance of this condition as a cause of delinquency in no way implies that the subjects thereof are to be simply allowed to do whatever they please. The welfare of society is of supreme importance. Our point is that these cases require treatment, in the interests of society as well as in their own, and that this treatment must be on special lines.

What is wanted is: (*a*) Recognition of these conflict cases by means of full investigation before trial; (*b*) appreciation by the courts of the value and the necessity of the treatment of these cases of conflict; (*c*) provision of means of treating these cases by (1) proper institutions, (2) perhaps some form of indeterminate sentence.

The willingness of the patient is essential for the treatment, for which reason we think that the probation system might well be combined, in certain of these cases, with remedial measures. The submission to such measures could be made a condition of probation. But this involves institutions at which, and practitioners by whom, this treatment can be carried out.

The publication of this paper, as expressing our personal views, is approved by the Prison Commissioners.

RENDLESHAM HALL, SUFFOLK.—The new sanatorium for the residential treatment of alcoholism and drug addiction, which was described in THE LANCET of May 5th last, is now in full working order, and a descriptive booklet has been issued which gives full particulars of the conditions under which the treatment, founded on voluntary lines with an eye to the physical comfort and general well-being of the patient, is carried out. How exactly suitable these conditions are is shown by the illustrations of sumptuous interiors and the charming prospects of beautiful old trees, delightful walks, and well-kept gardens. There is also every facility for indoor recreations. Rendlesham Hall stands in 270 acres of its own grounds and in the centre of some 5000 acres of preserved land, full of game, and is an ideal place for the purpose for which it is intended, having all the charm of a large country mansion with effective medical treatment on the spot. The London offices are at 29, Ridge road, Stroud Green, London, N.8, from where the pamphlet can be obtained from the Secretary of Norwood Sanatorium, Limited.

THE INTER-RELATIONSHIP OF BLOO
FAT AND BLOOD-SUGAR.

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THE presence of lipæmia and acetonuria in nearly
conditions in which there is a disturbance of carb
hydrate metabolism has suggested to many observe
the intimate relationship of the fat and sugar in t
body. Whether ketosis can be explained entirely by
deficiency of oxidising carbohydrate, or whether it
due also to a disturbance of a physical or chemic
combination of the two substances, is a problem whi
has yet to be solved. Some years ago Newburgh a
Marsh[1] demonstrated the ease with which ketosis m
clear up in certain cases of diabetes, in spite of a hi
fat dietary, and we have observed in several cases
severe diabetes an almost complete disappearance
acetonuria where the sole dietary has consisted
3 oz. of cod-liver oil daily. In one instance the dai
acetone excretion fell from 3 to 0·2 g. within six da
and was accompanied by a rise in the alveolar CO_2 a
a general amelioration of the patient's conditio
These phenomena are difficult of explanation
carbohydrate be looked upon as a necessary fuel f
the combustion of fat. On the other hand, excess
fat in the diabetic dietary is a frequent source
glycosuria, as has been pointed out by Allen, and
was noticeable in our own cases, above mentione
that the glycosuria took much longer to clear up th
with starvation alone, in spite of the rapid fall
acetone excretion.

There is some experimental evidence of an int
relationship between the two substances. Bie
many years ago produced glycosuria by ligature of t
thoracic duct, and though the experiment has be
confirmed by others the result has been various
attributed to nervous irritation, an interference with
pancreatic secretion travelling via the duct, or to
disturbance of fat metabolism. The occasior
coincidence of chyluria and glycosuria in man sugges
however, that the last explanation is the mo
probable. In one such case under the care of I
G. R. Murray, which we had the opportunity
observing, these symptoms appeared to be associat
with a disturbance of liver function, as they we
accompanied by temporary enlargement of that org
and by jaundice. Again, in phosphorus poisonir
where there is much disturbance of fat metabolism, t
liver appears to be unable to store injected dextrose
glycogen. De Fillipi showed that sugar is less w
tolerated by a starving than by a well-fed dog, a
lactose is better tolerated when given in milk th
when taken alone. Cramer found also that t
administration of lard along with sugar raises t
limit of tolerance.[2]

Of the physiology of fat after reaching the blo
stream little is known. Apparently it enters into so
combination from which it cannot be extracted
ordinary solvents, the so-called "masking" of fa
but a direct combination with glucose has never be
proved, although a compound of mannitol and
fatty acid has been synthesised in the laboratory.

Method of Experiment.

The following experiments were made with a view
investigating this relationship. The problem is diffic
and did not appear to be one which could be attack
by animal experiments, as both fright and anæstheti
may raise the blood-sugar considerably. As All
has shown that glucose given intravenously behav
differently from that absorbed from the intesti
oral administration only was resorted to, the expe
ments being made chiefly on ourselves so that the di

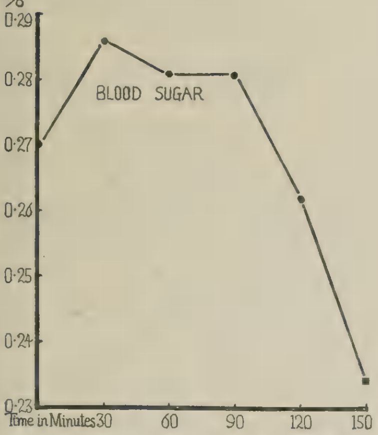
ould be controlled as far as possible. The blood-ugar was estimated by Maclean's method and the lood-fat by Bloor's, both of which are sufficiently well nown as to require no further mention here. It is oticeable that considerable variations were found in he amount of blood-fat in spite of prolonged fasting. ontrol experiments were made: in the estimation of lood-sugar the error was found to be negligible; in he estimation of blood-fat it was not greater than per cent.

In a normal subject after 50 g. of glucose the lood-sugar curve rises to 0·17–0·2 and falls to normal r below in 60 to 90 minutes. As Maclean has ointed out, sugar is still being absorbed from the ntestine at the end of that period, but apparently some echanism has been brought into action which stores he sugar as soon as it has been assimilated, and, within mits, the rise of the blood-sugar curve appears to be ndependent of the nature or quantity of carbohydrate aken (except lævulose). We have noted that if n ounce of fat or alcohol be taken an hour before a ose of 50 g. of glucose, although there may be some elay in the beginning of the rise of the curve—resumably owing to a retarded passage through the tomach—yet once the rise has started it follows a ormal curve, much as when glucose alone has been aken. It seems reasonable to deduce, therefore, that he blood-sugar curve should be regarded as an ndication of the capacity for storage rather than as a easure of the rate of absorption from the intestine. ariation in the rate of absorption is, however, a ource of error in all these experiments and is navoidable, but as all were done on an empty tomach and were frequently repeated we believe it has een reduced to a minimum.

The Effect of Fat on Blood-Sugar.

If fat be taken there can usually be observed a arked fall in the blood-sugar. Fig. 1 shows the ffect of 1 oz. of utter on a iabetic who had asted for 12 ours previously. his fact has een observed by ammidge and is co-workers[3] nd has been onfirmed by us n numerous ccasions. There ppear to be two ossible explanaions of this ffect of fat on he blood-sugar: ither there was ncreased use of ugar to oxidise he excess of fat n the blood, or ome inhibitory echanism has een brought nto play, leading to an increased storage of arbohydrate.

FIG. 1.



Effect of 1 oz. of butter on the blood-sugar of a diabetic.

The Effect of Fat on Adrenalin Hyperglycæmia.

A hypodermic injection of 20 minims of adrenalin nvariably produced a bigger rise of blood-sugar if at had been taken previously, the subject and the iet on each occasion being identical. The longer the nterval between the taking of the fat and the injecion of adrenalin, the greater the rise. This was articularly noticeable after cod-liver oil, which s known to be absorbed more rapidly than any ther form of fat. Table I. shows the results btained.

These results appear to indicate an increased storage f carbohydrate after fat has been taken.

TABLE I.

		Maximum rise of blood-sugar.
(1)	No fat	0·16
(2)	,, ,, ...	0·159
(3)	75 c.cm. cod-liver oil 1 hour previously ..	0·164
(4)	75 ,, olive ,, 3 hours ,, ..	0·21
(5)	75 ,, ,, ,, 3 ,, ,, ..	0·198
(6)	75 ,, cod-liver ,, 3 ,, ,, ..	0·242

Three possible explanations suggested themselves to us to account for the increased storage: (*a*) The conversion of fat into carbohydrate; (*b*) the direct use of fat as a source of energy, thus sparing the carbohydrate stores; (*c*) some action of the fat on the storage of carbohydrate.

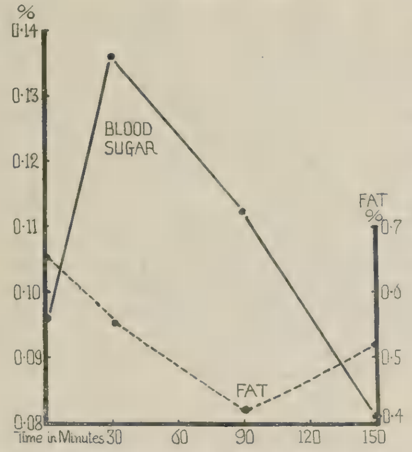
Of these the first seems improbable; even if so complicated a chemical reaction does occur, the time between the taking of the fat and the injection of adrenalin appears too short for the transformation to have taken place. In addition, the feeding of fat to a phloridzinised or depancreatised dog has been shown to produce no increase of glycosuria. With regard to the other explanations, both appear possible; the following experiments, however, seemed to show that the fat may take a more active part in the storage of carbohydrate.

The Effect of Sugar on Blood-Fat.

We have shown that fat diminished the sugar in the blood; we next investigated the effect of sugar on the blood-fat and found it produced a diminution of the latter. Sometimes the fat curve rose again after the sugar was absorbed (Fig. 2); occasionally it reached a higher point than when the experiment was commenced. Sometimes it produced a continuous fall of blood-fat. Table II. shows some of the results obtained after a dose of 50 g. of glucose. The experiments were done 7 to 18 hours after a meal, and as we found by control experiments that the blood-fat fell to normal after the sixth hour, there can be no question of absorption from the intestine. It was not a concentration effect, as the hæmoglobin remained constant throughout.

Excess of sugar, therefore, appears to have a considerable, if temporary, effect on the amount of extractable fat in the blood.

FIG. 2.



Effect of 50 g. of glucose on the blood-fat.

Effect of Calcium Salts.

By giving large doses of calcium salts (100 gr. of either the lactate or chloride) we were able temporarily to increase the acetone in the urine both in normal and diabetic subjects. Usually this was considerable, but occasionally it did not occur in certain of the more severe cases of diabetes. Allen and Wishart[4] were unable to find any increase of blood-fat on giving calcium salts to dogs. We found invariably, however, that calcium salts raised the blood-fat both in normal and diabetic persons. We were able to produce this after fasting for 18 hours; the effect, therefore, was not due to an increased absorption from the intestine. As the blood-sugar and hæmoglobin were not increased, this was not a concentration effect, nor did it appear to be due to an inhibition or oxidation of the fat by the blood-sugar, as if that were so one

Table II.

Subject.		Duration of fast before expt.	Commencement.	1 hr. later.	2 hrs. later.
		Hours.	Per cent.	Per cent.	Per cent.
T.H.O.	..	7	0·630	0·420	0·520
,,	..	8	0·589	0·470	0·459
A.H. ..	..	18	0·518	0·476	0·614
T.H.O.	..	8	0·320	0·260	0·310
A.H. ..	..	18	0·363	0·357	0·351
T.H.O.	..	18	0·416	0·375	0·233

would expect an accumulation of the latter. The increase of fat appears to be due either to a liberation of compound which had previously masked the fat, or to a mobilisation from the tissues. The association of a temporary lipæmia with an acetonuria after calcium salts seems to show that the latter is not due to an increase of the permeability of the kidney as we had at first supposed. Table III. gives some results.

Table III.

Subject.		Duration of fast before expt.	Commencement.	1 hr. later.	2½ hrs. later.
		Hours.	Per cent.	Per cent.	Per cent.
T.H.O.	..	8	0·390	0·420	0·595
,,	..	8	0·320	0·320	0·730
,,	..	8	0·480	0·390	0·515
,,	..	18	0·346	0·349	0·430
Diabetic	..	8	1·24	1·46	1·30
A.H. ..	..	8	0·516	0·590	—
T.H.O.	..	8	0·412	0·488	0·329

If 50 g. of glucose be given three hours after 100 gr. of calcium the blood-sugar curve was found to be higher than normal, usually rising to 0·2 per cent. or over, and failing to return to the previous figure in 1½ hours; sometimes it had not become normal in two hours' time. We also found that if the blood-fat had been raised by a dose of calcium it was not lowered by 50 g. of glucose as in Table II. This suggests that the blood-fat had been altered in some manner, so interfering with the mechanism of storage. In a mild diabetic who had been free from sugar for over a year 100 gr. of calcium so altered his metabolism that he was unable to take any carbohydrate without becoming glycosuric, although previously he had been able to take 2 oz. of white bread daily with impunity. This condition was transient and returned to normal in a fortnight's time.

Calcium has been shown by Clowes to be intimately concerned with the surface-tension of fat and can convert an emulsion of fat in water into one of water in fat. A possible explanation of the above experiment is some alteration of the surface-tension of the blood-fat diminishing permeability into the tissues in much the same way as it is known to affect the permeability of the kidney.

The Effect of Fat on the Blood-sugar Curve.

If fat be taken in considerable quantities (75 c.cm. of cod-liver oil or olive oil) 4 to 12 hours before 50 g. of glucose, so that when the latter is given the blood is flooded with fat, or if the sugar be suspended in fat, a marked prolongation of the sugar-curve results; the rise is usually greater than normal, often up to 0·24 per cent., and this usually has failed to return to normal in two hours, assuming at times almost diabetic proportions. Excess of free fat in the blood, therefore, appears to interfere with the absorption of glucose by the tissues. We have repeated this experiment many times, as our results appear to be the direct opposite of those of Labbé and Theodoresco, who found that fat diminished the rise of the blood-sugar curve.[5] If, however, a large quantity of fat be taken 18 to 24 hours before the dose of glucose, thus allowing it to be assimilated into the tissues, this effect is not seen; on the contrary, we have noted a more rapid fall of the blood-sugar under these circumstances.

Discussion of Results.

Although the results obtained cannot be looked as conclusive, and are probably affected to some exte by variation in the rate of absorption, the abo evidence seems to show that the blood-sugar has relation to the blood-fat, other than that of a me oxidising agent. Fat properly absorbed into t tissues appears to increase the storage of carbohydrat if not so absorbed, or if mobilised by calcium, t storage is interfered with. Possibly improper stora of the fat may account for the tendency of a high diet to produce glycosuria in some cases of diabetes.

It is noticeable that practically all conditio which lead to a hyperglycæmia lead to a lipæmia well; this may be attributed to diminished oxidatio We have been able to produce a distinct rise blood-fat in addition to a hyperglycæmia by t injection of adrenalin (from 0·48 to 0·56 per cent. in this case, at least, it is difficult to understa why the liberation of a large amount of oxidisi material should be accompanied by an increase of t substance to be oxidised. We suggest that a mo probable explanation is that both were stored a liberated together, an explanation which recent wo on the effect of insulin in diminishing lipæmia do much to confirm.[6]

In conclusion, we wish to express our thanks Prof. Shaw Dunn for allowing these experiments be conducted in his laboratory.

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2. MacLeod: Diabetes, 1912, p. 204.
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A SERIES OF CASES OF TUBERCULOSIS TREATED WIT SPAHLINGER'S VACCINE.

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During the period 1913–14, the following cas were treated at Victoria Park, by means of t Spahlinger vaccine. (Cases 10 and 11 were treat with serum.) In each case the nature of the treatme was explained as far as possible to the patient or h relatives, and permission to use it obtained. One us (E. H. C.) was responsible for the treatment, an the other (S. R. G.) for the laboratory examinatio involved, whilst Mr. Spahlinger himself prepare the vaccines in his own laboratory. As far as we ca ascertain, the following list comprises all the cas treated, with the exception of one, some sheets whose record have been unfortunately mislaid. was not a fatal case. On leaving Victoria Par some of these patients had a further course of vacci at Mr. Spahlinger's laboratory in London unt October, 1914, but the records here given deal onl with the period of their treatment in Victoria Pa Hospital.

Case 1.—J. W. A., aged 35, light meter maker. Fami history of tuberculosis. History of cough for last two winte hæmoptysis two months ago. On admission, 21/6/191 there were signs of infiltration at right apex and left upp lobe; mild pyrexia, small amount of sputum, tuberc bacilli present; weight, 8 st. 10½ lb. Thirty-two injectio given. On discharge, 17/1/1914, there were no acti physical signs, temperature was normal, the last thr sputum examinations were negative, and the weight 9 s 3½ lb. In 1923 reported as well and at work since 1915.

Case 2.—J. H. C., male, aged 39, furniture remove porter. History of cough, hæmoptysis six years ago an again recently, and of loss of weight (1 st.); in-patient Brompton Hospital, 1909, later Mount Vernon, and South Mimms. On admission, 29/11/1913, signs of some re-activity of old lesions, but afebrile; weight, 10 st. 13½ lb. There was a small amount of sputum, tubercle bacilli found once in 19 examinations. Twenty-three injections given. On discharge, 9/4/1914, there were no signs of active disease, and weight was 11 st. ¼ lb. In 1923 reported as well and at work since 1915.

Case 3.—C. D., male, aged 34, cook. Pulmonary tuberculosis first diagnosed in 1911; had lost 9 lb. in weight. On admission, 4/8/1914, there were signs of infiltration of right upper lobe and left apex, mild pyrexia; weight, 9 st. 10¼ lb. Sputum was scanty and contained tubercle bacilli. Had had injections of Spahlinger vaccine before admission. Five injections given at Victoria Park. On discharge, 3/10/1914, there were no signs of active disease, temperature was normal, sputum absent, and weight 10 st. 1 lb. In 1923 reported as well and as having been in active work since 1915.

Case 4.—G. W. J. F., male, aged 37, general labourer. Father and one sister had died of tuberculosis. Had lost 23 lb. in weight. Had previously been an in-patient at Victoria Park in 1912, when he had 29 sputum examinations, only one of which was positive; transferred to sanatorium n 1913. On admission again, 27/5/1914, signs were chiefly bronchitic, with some infiltration of both lungs; there was mild pyrexia with scanty sputum, 17 examinations for tubercle bacilli being negative; weight, 9 st. 6½ lb.; dyspnœa on exertion, pain in chest, palpitation, giddiness, indigestion. Fifteen injections given. On discharge, 14/10/1914, there was no evidence of active disease beyond a few scattered rhonchi; temperature normal; weight, 9 st. 13¼ lb. Enlisted n army during war. At present time attending out-patient department as a pensioner; three examinations of sputum for tubercle bacilli have been negative. Reported as at work since war service.

Case 5.—F. M. J., female, aged 34, post-office clerk. Father died of pulmonary tuberculosis. History of cough, general weakness, dyspnœa, night-sweats, loss of weight (1 st.). Hæmoptysis three months ago. On admission, 24/10/1913, she had tachycardia, pains in back, indigestion, and signs of infiltration of both upper apices and left base; no fever; a trace of sputum on one occasion only, when it contained no tubercle bacilli; weight, 6 st. 8 lb. Fourteen injections given. On discharge, 17/1/1914, moist sounds had cleared up and weight was 6 st. 8¾ lb. In 1923 reported as well and at work since 1914.

Case 6.—J. E. P., female, aged 39, married. Father died of pulmonary tuberculosis. History of cough, dyspnœa, night-sweats, general weakness, and loss of weight (1 st.), six months' duration; hæmoptysis three months ago. On admission, 24/10/1913, she had pain in back, indigestion, tachycardia, and slight pyrexia, with signs of early infiltration of both apices and left base; a trace of sputum obtained on wo occasions only, no tubercle bacilli present; weight, st. 13 lb. Eleven injections were given. On discharge, 20/12/1913, there were no active signs in lungs and no pyrexia; weight, 8 st. 5 lb. In 1923 reported as well and at work since 1914.

Case 7.—A. W., male, aged 49, hairdresser. History of ough for last seven years, with hæmoptysis three years ago, nd recent loss of weight (10 lb.). Pulmonary tuberculosis irst diagnosed in 1911, when he had treatment in a sanatorium. On admission, 22/9/1913, there were signs of infiltration of whole of right lung with excavation and disease of left upper lobe; laryngitis; afebrile; half an ounce of sputum daily, tubercle bacilli present; weight, 9 st. 6 lb. Thirty-two injections given. On discharge, 10/2/1914, chest almost dry, sputum very scanty, bacilli present on last examination a week before discharge; afebrile; weight, st. 8 lb. In 1923 reported as well and at work since 1914.

Case 8.—J. C. N., aged 40, chauffeur. History of cough. wo to three months' duration, with loss of weight (6 lb.) nd a streak of blood in sputum a fortnight before admission. Admitted 19/9/1913, with signs of infiltration of upper lobe, half an ounce of sputum daily, tubercle bacilli present; afebrile; weight, 9 st. 2 lb. Twenty-three injections given. On discharge, 15/1/1914, no moist sounds were found in lung, and last four sputum examinations showed no tubercle bacilli; afebrile; weight, 8 st. 11 lb.

Case 9.—W. T., male, aged 37, engineer's labourer. History of chronic cough for some years, with loss of weight 9 lb.), tubercle bacilli reported to have been found in sputum by panel doctor and also whilst at sanatorium. On admission, 18/10/1913, there were signs at both apices and left base behind, but sputum was scanty, and no tubercle bacilli were present: afebrile; weight, 10 st. 5¾ lb. Fifteen injections given. On discharge, 14/1/1914, there were no signs of activity, still a trace of sputum, but nine examinations for bacilli had been negative; afebrile; weight, 10 st. 8½ lb. Reported as killed in France during the war.

Case 10.—A. E. F., male, aged 37, brass-plate maker. History of cough, &c., 10 weeks' duration, and loss of weight (15 lb.). On admission, 20/10/1913, he had dyspnœa, general weakness, pain in chest, indigestion, and signs all over left side (? pleuritic) and at right upper lobe, with a trace of sputum but no tubercle bacilli; febrile; weight, 8 st. 2 lb. Eight injections (serum) given. On discharge, 28/2/1914, no moist sounds were heard in lung and 15 sputum examinations had been negative; afebrile; weight, 8 st. 12½ lb.

Case 11.—F. E., female, aged 14. Father and mother died of tuberculosis. History of enlarged glands of neck since three years of age. On admission, 31/10/1913, there were enlarged hard glands on left side of neck, one of them showing signs of breaking down; no signs in lungs, and the trace of sputum obtained on four occasions showed no bacilli; afebrile; weight, 5 st. 2 lb. Eleven injections (serum) given, followed by three more after an interval of rest. On discharge, 1/4/1914, glands had subsided and weight increased to 5 st. 11 lb.

Case 12.—J. P., male, aged 18, hairdresser. History of cough, &c., two years' duration. On admission, 27/1/1914, there were signs of infiltration of whole of right lung and left apex; sputum scanty, bacilli present; afebrile; weight, 8 st. 13¼ lb. Twenty injections given. On discharge, 20/7/1914, there were still moist sounds in right lung with scanty sputum, and bacilli present; afebrile; weight, 9 st. 8½ lb. Readmitted with stained sputum and tubercle bacilli present, 3/4/1917, but discharged at own request a fortnight later and joined the army. Readmitted again in 1922 and died. Autopsy refused by relatives.

Case 13.—H. P., male, aged 25, railway clerk. History of cough eight months' duration. On admission, 11/8/1914, there were signs of infiltration of both apices with scanty sputum, tubercle bacilli present; febrile; weight, 9 st. 10 lb. Only four injections given; Spahlinger's vaccine treatment then stopped, owing to outbreak of war. On discharge, 7/6/1915, no moist sounds were heard, tubercle bacilli were still present; afebrile; weight, 10 st. 3¾ lb.; transferred to sanatorium.

Case 14.—E. F., male, aged 34, schoolmaster. Two brothers died of pulmonary tuberculosis. History of cough, &c., two and a half years' duration, loss of weight, and hæmoptysis. On admission, 25/5/1914, there were signs of infiltration of right upper lobe and left apex; sputum scanty, bacilli present; weight, 12 st. 10 lb. Sixteen injections given. On discharge, 17/9/1914, the lungs were practically dry, sputum scanty, bacilli present; weight, 12 st. 12 lb. Patient reported himself as well and at work in 1916 and again in 1917. In 1923 reported as not traced.

Case 15.—J. H., male, aged 32, joiner. An advanced case who came over from Paris specially to try the treatment. Three years' history. On admission, 19/5/1914, there were extensive signs in both lungs, with three to four ounces of sputum daily and tubercle bacilli present in large numbers; irregular pyrexia; weight, 8 st. 4¼ lb. As no Spahlinger serum was then available and patient was considered too advanced for vaccine treatment, eight injections of lipoids (lecithin, &c.) prepared by Mr. Spahlinger, were given. Patient got steadily worse, and died 16/7/1914. Autopsy could not be obtained.

Case 16.—C. N., male, aged 22, student. History of pleurisy a year ago. On admission, 15/7/1914, there were signs of fibrosis of whole of left lung and recent infiltration of right apex; sputum scanty, bacilli present; febrile; weight, 10 st. 6¾ lb. Nine injections given, and Spahlinger treatment then stopped owing to outbreak of war. Subsequently an autogenous streptoccocal (from sputum) vaccine given. On discharge, 9/2/1915, signs in lungs had not markedly altered, but sputum contained no tubercle bacilli; still febrile; weight, 10 st. 6 lb.

Case 17.—A. W. T., male, aged 34, groom. History of cough, hæmoptysis, &c., for the last ten weeks. On admission, 1/12/1913, there were signs of infiltration of right upper lobe, with excavations at apex and infiltration at left hilus; slight pyrexia; sputum scanty, tubercle bacilli present; weight, 9 st. 9 lb. On discharge, 30/6/1914, no moist sounds were heard; afebrile. In 1920 reported as well and at work, and in 1923 as not traced.

In fairness to Mr. Spahlinger we would point out that the cases were treated during the early stages of his research, and that the work was interrupted by the war. We have refrained from making any comments on the cases.

ACUTE *BACILLUS COLI* INFECTION OF THE GASTRO-INTESTINAL TRACT

IN A NEW-BORN BABY, CONTRACTED FROM ITS MOTHER.

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There are very few records of fully investigated cases of acute gastro-intestinal infection in the new-born contracted from the mother at birth detailed in the literature. Julius Hess[1] states that streptococcal infection of the infant may occur through the maternal circulation, or secondarily through the mother's milk, lochia, or other infected material reaching the gastro-intestinal tract of the baby. Infections of the intestinal tract due to dysentery, typhoid, and paratyphoid bacilli are seldom seen during the first few days of life unless the mother is infected, but colon infections are not so uncommon. Nauwerk and Flinzer[2] quoted by Ritter von Reuss, refer to the case of a child who died on the second day after birth from melæna. *B. paratyphosus* B was isolated and was agglutinated by the mother's blood. The mother, a few weeks before delivery, had suffered from severe diarrhœa. These authors also suggest that during birth infection of the child may occur from bacteria present in the mother's vagina, or that infected lochia may be swallowed by the child and cause an infection of the intestinal tract.

As we possess the full records of the illness of a child from birth up to and including the period of convalescence, we have considered it advisable to place our observations on record so that this method of infection of the child may be fully considered in the future. The mother in this case had suffered from an infection of the urinary tract due to a colon bacillus which had caused acute symptoms with high temperature and the usual associated clinical phenomena on two occasions during the antenatal period.

It may be advantageous here to refer briefly to the work of Dudgeon, Wordley, and Bawtree[3] on *B. coli* infections of the urinary tract. They have divided these infections into hæmolytic and non-hæmolytic, and further subdivided the two groups with agglutinating antisera. They have shown further that in colon infections of the urinary tract it may be possible to isolate the causative organism from the intestinal tract. In their experience, the most severe urinary infections are caused more commonly by hæmolytic strains, and the infections caused by hæmolytic colon bacilli are more common in the male sex. The commonest hæmolytic strain in coli infections of the urinary tract is that labelled by them as "Dow," and this is the responsible organism in the case about to be described in detail.

Clinical History.—Female child; full term; labour normal. Birth weight 8 lb. Breast-fed from birth, at four-hourly intervals; five feeds. The third day after birth the baby became very restless and began to vomit. The vomiting occurred during feeds and in the intervals, on the average three to four times daily. Test weighing showed that it received 21 oz. of milk on the fifth day. From the sixth day it was fed on expressed breast milk diluted one-third, so that the total amount of milk allowed was 15 oz. Normal meconium was passed at the outset, but on the fifth day mucus began to be present in the stools. The child was first seen by one of us (R. C. J.) on the ninth day; she was then very restless, the limbs were rigid, colour was greyish. She was passing thick tenacious mucus, vomiting mucus, and had three septic fingers. Temp. 99° F. Weight, 7 lb. 3 oz.

Treatment.—Treatment was commenced by giving 1 drachm each of castor and olive oils. She was fed on expressed breast milk, boiled for four minutes and diluted one-fourt with water. On the twelfth day the condition was wors the greyish colour was more marked; vomiting was mo frequent and much more mucus was passed per rectum the weight had fallen to 7 lb. Rectal irrigation was order with a solution of bicarbonate of soda followed by norm saline. During the next few days the amount of muc passed in the stools was excessive; restlessness was ve pronounced; there was evidence of severe abdomin discomfort, and the fingers were still septic. Rectal lava caused the evacuation of considerable quantities of mucu together with milk curds. The temperature varied fro 97°–99°. Some septic spots now appeared on the bac Castor oil was given at repeated intervals, and syrup dimol, 15 minims, three times daily. The weight fell 6 lb. 14 oz. on the seventeenth day.

Course of Condition.—On the twenty-fifth day feeding wi breast milk had to be discontinued owing to the mother condition, as in addition to a colon infection she was sufferi from organic heart disease. The child was then fed on modified unsweetened condensed milk mixture givi percentages of sugar 5·7, fat 1·4, protein 1·4. The calor value of the food was 216 against a theoretical calor requirement of 350. The sugar (dextri-maltose) was gradual raised to 7 per cent., but the fat was kept low owing to marked inability to digest fat. By the thirty-fifth day th child was taking sufficient food to yield its theoretic caloric requirement—i.e., 350 cals. Mucus continued to passed at intervals but became much less; the sept lesions healed and the colour improved. Orange juice w later introduced into the diet. Small vomits continued aft feeds, and in some of these mucus was present. The weig showed a steady increase. From the thirty-second day th diet was gradually changed to a fresh cows' milk mixtur giving percentages of sugar 6·9, fat 2·7, protein 1·5. was not until the sixty-ninth day after birth that the muc had disappeared from the stools on naked-eye examinatio and these now became normal for the first time. Aft this time the vomits were less frequent, but they still co tained small quantities of mucus at intervals. The cow milk mixture was continued, but it was still found necessa to keep the fat down to 2·7 per cent. (a 50 per cent. cru cod-liver oil emulsion was used to adjust the fat).

The child now (18 weeks) appears to be in better health the stools are normal, but there are still occasional vomi with mucus, and the last sample of mucus examine (at 16 weeks) showed the presence of the same strain *Bacillus coli* in abundance. The temperature varies betwee 98° and 99°. The urine (at 18 weeks) contained bacil but no pus, and the bacillus proved to be the same strain *Bacillus coli* as found elsewhere.

Bacteriological Examination of Mother.

Urine.—Very turbid; pus, masses of Gram-negati bacilli, and traces of sugar present. A pure culture w obtained of an actively hæmolytic colon bacillus.

Lochia.—Leucocytes abundant and Gram-negative bacill pure culture obtained of an actively hæmolytic colo bacillus. Breast milk: First examination made 11 da after the birth of the child; some polymorphs presen but no bacteria seen; epithelial cells numerous, both tho containing fat droplets and fat-free cells. Free fat an degenerated cells abundant. A considerable growth w obtained of a non-hæmolytic Gram-positive short-chain strepto-diplococcus, which formed acid in mannite, lactos and salicin, firmly clotted milk, but inulin was unaffecte The milk was re-examined a week later; streptococci we present but relatively scarce, but the *Staphylococcus alb* was abundant. Colon bacilli were not cultivated on eith occasion.

Blood.—Examination made 18 days after the confinemen Red cells, 4,260,000 c.mm.; hæmoglobin, 72 per cent. colour index, 0·8; leucocytes, 6720 per c.mm.; polymorph 71 per cent.; eosins, 6 per cent.

Blood Serum.—The blood serum gave an end-poi agglutination with the typhoid antigen of 1 in 100, 1 in with paratyphoid A, but no reaction with B or C (inoculation

Bacillus Coli Reactions.—Several strains were employe as antigens, but the only positive reaction occurred with t standard hæmolytic urinary antigen "Dow" which similar to the organism infecting both mother and chil A complete reaction occurred with a dilution of 1 in 10 incomplete 1 in 400, and the end-point of the reaction w 1 in 1000. The serum was also tested for the precipit reaction with the same strain of colon bacillus. The filter antigen employed by Dudgeon, Wordley, and Bawtree[3] w used. A positive reaction occurred with dilutions 1 in 5, 10, 20, 40, and 80.

Bacteriological Examination of Infant.

Fæces.—Mucus present in great abundance; well-marke bile reaction obtained; blood present and masses of bo leucocytes and epithelial cells. Fats and soaps also presen very heavy growth was obtained of the hæmolytic bacillus oli, and of a non-hæmolytic streptococcus. These were the nly bacteria present on blood-agar plates after the motion ad been dried on tiles as introduced by Dudgeon for the outine bacteriological examination of the fæces.[3] [4] The treptococcus present in the fæces of the baby was morphoogically and culturally similar to the streptococcus which ad grown so abundantly in the mother's milk, and in both nstances was non-hæmolytic. The *B. coli*, which was ctively hæmolytic in solid and liquid media, was similar in very detail with the strains isolated from the mother. second examination of the baby's fæces was made 14 days ater. They were now semi-solid, and only traces of mucus ere present. Hæmolytic colon bacilli were present, but elatively scanty as compared with the previous records. umerous colonies of hæmolytic *Staphylococcus aureus* and *lbus* were obtained and of non-hæmolytic streptococci. he urine was normal, but during convalescence the infant eveloped a bacilluria, due to the same strain of colon acillus.

Vomit.—The thick mucus vomited by the baby was xamined. Bacilli were found to be numerous, and an bundant growth of hæmolytic colon bacilli and nonæmolytic streptococci were obtained. On re-examination ne week later colon bacilli were not cultivated, but were solated at a later period.

Colon Bacilli.—The same strain of colon bacilli was solated from the urine and lochia of the mother, and from the ntestinal mucus, gastric contents, and urine of the infant. he colonies formed abundance of acid and gas in lactose and annitol, rapidly clotted milk, gave a marked indol reaction, nd did not liquefy gelatin. Saccharose was rendered lkaline, while acid and gas was formed in dulcitol, but this edium subsequently became alkaline. These colon strains ere very actively hæmolytic on blood-agar, and in 0·5 er cent. and 0·85 per cent. sodium chloride in peptone water o which 0·1 c.cm. of human red cells was added. The æmolytic action was of equal intensity in both the stages etailed by Dudgeon, Wordley, and Bawtree.[3]

Serological Results.—The bacilli isolated from the various ources referred to were subcultured on ten successive ccasions in veal broth and tested with the various colon nti-sera derived from hæmolytic and non-hæmolytic strains eferred to by the above-mentioned investigators. The nti-serum made from the commonest hæmolytic colon train known as " Dow " reacted to full titre with these ultures. The end-point of 1 in 20,000 was reached, which s the limit of reaction between the anti-serum and its own ntigen. It was also shown that the blood of the mother eacted with this antigen to the extent of $\frac{1000}{20000}$, which is very strong colon agglutination reaction for a human serum.

Harvey Cushing and Livingood[5] published a most nteresting and valuable contribution to the bacterioogy of the alimentary canal in the Johns Hopkins ospital Reports in 1900. The intestinal flora are rouped into the obligatory or permanent intestinal acteria, and the transient which are introduced with he food and persist only when a suitable pathological rocess is present in the intestinal mucosa or when they re the cause of such a condition. Cushing and Livinood refer to the original work on human sucklings by scherich in 1885 and 1886, where he showed that *. lactis aerogenes* is the obligatory form which is resent high up in the digestive tract, while *B. coli* lourishes lower down. The essential fact, however, hat these bacteria which are not present in the neconium at birth must enter with the food, swallowed ir, or during bathing of the infant, is discussed. In ur case the colon bacillus was present in pure culture n the stomach mucus, as well as in that passed per ectum, and the organism known as the *B. lactis erogenes* was not isolated. Todd[4] examined 101 pecimens of normal fæces from 91 healthy children nder 1 year of age. The stools were examined acteriologically by Dudgeon's method referred to in etail by Todd and Wordley.[6] Hæmolytic colon acilli were obtained in 12 cases, and in eight of the umber the ages of the babies, which were breast-fed, aried from 2 to 19 days. It is important, however, to ontrast the findings in our case, in which the colon acilli cultivated at the commencement of the llness were all hæmolytic and were present in great bundance, with the findings in Todd's cases, where æmolytic colonies were present, but only in limited umbers. Of the eight strains isolated by him, six ere agglutinated by the colon anti-serum (hæmoytic type " Dow ") which is the same anti-serum as e employed.

Discussion.

At the present time, while world-wide attention is devoted to the subject of infant welfare and the causes of infant mortality, it is of the utmost importance to realise that various infective conditions may occur at the ante- and post-natal periods and at the short interval during the birth of the child. It is to this intermediate or intra-natal stage that this case which we have described in detail belongs. In this instance the mother was infected with a certain strain of *B. coli* which had produced two attacks of acute coli fever. The urine contained a large amount of pus and masses of bacilli, and the lochia also were similarly infected. In our opinion, the baby was infected at birth by swallowing the urine or lochia in which the organism was present in abundance. There is very little information to be obtained from the literature of this method of infection, although some continental and American writers refer to it. The possibility of the child being infected during the ante-natal period with this organism must also be considered, as it is known to occur in typhoid and paratyphoid fevers from infection in the mother. Our view that the infection occurred at birth is supported by the fact that the illness commenced about three days after birth, and the condition of the child at birth was perfectly satisfactory. The illness commenced and continued with gastro-intestinal symptoms and associated clinical phenomena. The child passed thick mucus by the bowel for some weeks and also vomited mucus. The causative organism was present in the intestinal mucus for many weeks, and 18 weeks from the onset of the illness it was present in the vomited material during a gastro-intestinal upset. At this period the urine was found to show a bacilluria due to the same organism. The illness was so severe that it nearly cost the life of the child, and improvement only occurred after many weeks of most careful nursing and treatment. It was thought that the mother's milk might also be infected with the colon bacillus, partly because of the general infection from which she had suffered, but also owing to information obtained by us from our investigations on the bacteriology of human milk which are now in progress. Repeated examination, however, failed to confirm this suspicion. It is possible from the available evidence that the heavy streptococcal infection of the mother's milk may have assisted in the causation of the gastro-intestinal infection in the infant.

In the case of breast-fed infants, a gastro-enteritis is very frequently caused by over-feeding, but when the amount of breast milk is proved by test weighing to be *not* in excess, and the enteritis continues with loss of weight, the case we have reported indicates the necessity for: (1) A bacteriological investigation of the breast milk, as well as a chemical examination; (2) a bacteriological examination of the stools and vomit of the child.

Further, when dealing with women known to have a coli infection, it would appear wise to take special care to cleanse the mouth of the child as soon as possible after birth with some non-irritant antiseptic solution, in a similar manner to which the eyes are treated with silver nitrate solution when a gonococcal infection in the mother is present.

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A CASE OF

QUINTUPLE PREGNANCY.

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In 1904 Prof. Nijhoff[1] of Groningen (Netherlands) published the notes of a case of quintuplets which occurred in the practice of his friend, Dr. De Blécourt. With De Blécourt[2] he collected from the obstetrical literature, from 1694 to 1900, 28 additional cases. These they published the same year in book form. Further cases were recorded by Bernheim[3] in 1904, Martin[4] in 1917, and Hehir[5] in 1922. We have not been able to procure a copy of De Blécourt's and Nijhoff's monograph, but in the four cases above quoted the children were all well formed, although immature, and in three cases at least they died in a few hours or days. In the case reported by Sir P. Hehir, the children were stated to be of quite large size and doing well the day following birth. To date, therefore, it appears that 32 cases of quintuple pregnancy have been recorded.

The case which we now report differs from those already quoted in that two of the five fœtuses were monsters. One was anencephalic, and the other a small monstrous embryo only 3 cm. long.

History.—The patient, a multipara aged 33, had been married 11 years, and pregnant four times. Her first pregnancy terminated in a full-term normal labour ten years ago, and the child is still alive and healthy. Five years later she had a second uneventful normal labour, child alive and well. On May 19th, 1921, she aborted a two months fœtus and the uterus was curetted. Following the curette, she developed an abscess in the uterine wall, which subsequently burst into the peritoneal cavity. The patient had a perilous time, but was able to leave hospital in five weeks.

Her fourth pregnancy is the one under consideration. Her last menstruation ceased on May 26th, 1922. She was first seen at the beginning of October (by S. R. F.), wasted, anæmic, and slightly jaundiced. The uterus reached to just below the umbilicus. No fœtal parts could be felt, the patient said she had not felt movements, and no fœtal heart could be heard. Other signs of pregnancy were present, however, and on bi-manual examination the abdominal tumour was undoubtedly the uterus. It was felt certain, therefore, that the patient had within her uterus a product of conception.

Admission to Hospital.—Although the vomiting ceased the patient continued to lose flesh and appetite. She was admitted into hospital on Nov. 2nd, 1922. The uterus had now reached to three fingers-breadth above the umbilicus, but still no fœtal parts could be felt and no fœtal heart heard. The patient was very thin and slightly jaundiced. An examination of the urine proved negative. It was decided to empty the uterus. The cervix was dilated up to No. 12 Hegar, and a small rubber hydrostatic balloon was inserted into the lower uterine segment. After remaining in for 24 hours without labour resulting, it was removed and on the 5th the lower uterine segment was plugged with gauze.

Delivery.—During the night the patient had labour pains, but they were weak, occurred only at long intervals, and finally ceased altogether at 6 A.M. Mr. Thomas Holmes examined the case, and at 11 A.M. on the 6th the patient was anæsthetised. After removal of the gauze the os was found to be almost completely dilated and a bag of membranes presenting. The membranes were ruptured, a pair of feet brought down, and a small fœtus extracted. Another bag of membranes presented and was ruptured, and another fœtus extracted by the breech. Two others followed in exactly the same way. Rather sharp hæmorrhage now occurred, and the placenta was removed manually. It was very adherent and unfortunately damaged a good deal in its removal. Attached to the placental mass by a long thin cord a small smooth body was noticed and preserved ; it proved to be a monstrous embryo. The four children were all immature, alive when born, but all died within half an hour. All were females, three were perfectly formed, one was an anencephalic monster. Their lengths and weights are as follows : (1) 29 cm., 15¼ oz. ; (2) 30 cm., 15½ oz. ; (3) 28 cm., 13¾ oz. ; (4) 23 cm., 9¾ oz. (anencephalic).

The fifth fœtus was entrusted to Dr. Thomas Walmsley, professor of anatomy in the University of Belfast, who stained and sectioned it, and reported it as being a small monstrous mass measuring 3 cm. in length. " Attached to about the centre part of its anterior surface there was a delicate umbilical cord which contained, as demonstrated on microscopic section, small thin walled blood-vessels. The embryonic mass itself, on section, was found to consist of a surface covering of well-differentiated ectoderm, in which skin glands were definitely formed. Within the ectoderm the tissue mass was of the undifferentiated round cell type a small amount of pre-cartilaginous tissue in the head region being the only definitive formation which could be recognised. There is no doubt, of course, of the embryonic nature of the rudiment."

The placenta weighed 15¾ oz. It was much damaged, but four separate amniotic sacs could be pieced together. The chorion could not be traced with any certainty. Five umbilical cords were attached to the placenta. Four were of ordinary size and corresponded to the formed fœtuses ; the fifth, attached to the small monster, was only 1 mm. in diameter and 4½ in. long.

The patient had a normal puerperium, and left hospital in 14 days much improved. Two months later she had regained her lost weight and was looking and feeling quite well. With regard to the family history, a sister of the patient has had one pair of twins, and the wife of a brother has also had twins once. Otherwise the family history is negative.

Our thanks are due to Prof. Walmsley for the preparation of the sections, to the librarian of the Royal Society of Medicine for the loan of papers, and to Mr. T. Holmes for permission to publish the case.

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Medical Societies.

MEDICO-PSYCHOLOGICAL ASSOCIATION OF GREAT BRITAIN AND IRELAND.

The eighty-second annual meeting of the Association was held at the rooms of the Medical Society of London and the Royal Society of Medicine from July 9th to 13th, under the presidency of Lieut.-Colonel E. Goodall (Cardiff Mental Hospital).

Sir Fredk. Willis, Sir Arthur Rose, and Dr. Havelock Ellis were unanimously elected honorary members of the Association. Dr. J. Carswell was appointed Maudsley Lecturer for 1924.

Dr. J. G. Porter Phillips (resident physician Bethlem Hospital) read a paper on

Early Treatment of Mental Disorder,

really a survey of the out-patient practice of that institution. He said that in its early stage mental disorder might often permit the individual to adjust himself to his surroundings and follow his avocation without ever deserving the label " insanity." The exacting nature of life was chiefly felt by those with a weak or unstable mental make-up. Latterly several specialised clinics had sprung up to deal with early treatment of mental disorder. The out-patient department at Bethlem Hospital was inaugurated in 1919, and in 1922 the Maudsley Hospital commenced the indoor and outdoor treatment of civilians. The most hopeful results were to be looked for in cases in which mental and physical collapse was only partial and there was a good history. On the economic side of the question he pointed out that the cost per patient in out-patient treatment was about one-tenth that of a resident patient in a county mental hospital. Early treatment not only avoided much domestic misery and exhaustion of other members of the family it also afforded good opportunities for research, whose results would greatly benefit mankind. At the Bethlem Hospital clinic 323 new cases were seen during the year. Dr. Phillips emphasised the great importance of the social side of this work carried on by the almoner and inquiry officer, who made careful and tactful inquiries into the home life and general conditions of the patients. He reviewed the provisions of the new Mental Treatment Bill, which he regarded as a stride forward in State medicine, remarking that the secret of modern progress often lay in propaganda.

The Relation of Chronic Sepsis to Mental Disorders.

This was the title of a very exhaustive paper by Dr. Henry Cotton, lecturer in psycho-pathology at Princeton (U.S.A.) University. He first paid a tribute to the part played by Dr. William Hunter in 1900, in drawing attention to the rôle of chronic sepsis in medicine; also to the work of Dr. Chalmers Watson.[1] In 1905 Dr. Cotton, working under Alzheimer at the psychiatric clinic in Munich, found distinct changes in the nerve cells in so-called functional disorders. Alzheimer regarded these changes as very significant. This shifted the conception of these disorders, which were previously considered to be primarily diseases of the mind and not of the brain. The former view was not logical, as abnormal structure seemed a necessary condition for abnormal functioning. He set himself to determine the cause of the associated fatty degeneration of the cortical nerve cells in the functional psychoses. A five years' study of disturbances of the endocrine system gave no decisive result, and gland therapy was a failure. In 1918, following the work of Hastings and King, they began to eradicate all foci of chronic sepsis from their patients, and the reward was an increase in the recovery-rate from 37 per cent. to 85 per cent. in the first year. Attention to the genito-urinary system was an important part of this work, and in some enucleation of the vesicles was necessary. It was not claimed that this work had solved the problem of mental disorders, but it had shown that disease of the brain tissue was the fundamental condition. The success of this work was based on the utilisation of all the methods developed in the field of general medicine, and especially that of chronic sepsis. Heredity, he thought, should not occupy the important place it had been assigned in the past: it was an idea which had been an obstacle to advance. He also thought that many of the extravagant claims made by psycho-analysts were unjustified, and Freudism had been a great handicap to psychiatry. He did not minimise the importance of the psychogenic factors in the causation of the psychoses, but regarded them as precipitative rather than causative, for in some cases psychosis developed without such factors being present. He proceeded to establish the thesis that chronic sepsis was a large and very important determining factor in mental disorders, and that these psychotic patients harboured multiple foci of infection. Hence he regarded the psychosis as a symptom—sometimes a terminal symptom—rather than as a disease entity. The paper contained a detailed reference to the foci found, and their micro-coccal inhabitants. He was able to return 82 per cent. of the discharges as recoveries; and a successful treatment of 1412 cases in four years.

A discussion followed, in which Dr. W. Hunter, Dr. Chalmers Watson, Dr. T. C. Graves, and others took part.

Dr. Clement Lovell (pathologist at Bethlem Hospital) read a paper on the

Surface Tension of the Serum in Anxiety Psychoses.

He said no relation had been traced between the disappearance of blood-sugar and the alteration of the surface tension; but by dialysing heated and unheated specimens against distilled water he found a difference in the union of electrolyte and protein in the normal person and the anxiety case. In anxiety cases he found there was increased nucleation of the interlobular connective tissue of the pancreas. If the theory he advanced was true, a large number of the anxiety cases were due to a disordered endocrine balance, in which the pancreas was primarily at fault. Hence the treatment should be aimed at stimulating the pancreas, and vaccine methods directed to inflammatory conditions.

Dr. R. M. Stewart read a paper entitled

General Paralysis: Its Unsolved Problems.

Among the questions he propounded were the following: Was the *Spirochæta pallida* alone responsible for the genesis of general paralysis? When and how did it gain access to the nervous system? Was there a special strain of it in these cases? Or must the individual resistance of the infected person be considered as the deciding factor in the development of the disease? What was the meaning of the long latent interval before the onset of symptoms? Why did the cerebro-spinal fluid contain no organisms at a time when the brain contained millions? Why did not tabes, general paralysis, and optic atrophy occur in conjunction more frequently? Why did arsenical compounds fail to cure? He devoted his paper to a consideration of two problems: (1) the time of invasion of the nervous system in general paralysis; (2) the existence of special neurotropic strains of the *Spirochæta pallida*. General paralysis of the insane seldom occurred less than six to ten years after syphilitic infection; in tabes the period was usually longer. It seemed probable that the spirochætes circulating in the blood-stream gained access to the brain or its membranes during the time of general dissemination, and lay dormant until there occurred a favourable opportunity for their multiplication. This view was supported by the biochemical and other changes in the cerebro-spinal fluid. If the spinal fluid and the nervous system showed changes in from 30 to 40 per cent. of all cases of syphilis, why did general paralysis develop in only about 5 per cent. of infected persons? Two explanations could be offered: the organisms which attacked the nervous system might do so because they possessed a special neurotropic action; or the disease might make its appearance because the patient possessed a neuropathic disposition. These he considered in some detail, pointing out peculiar racial features in regard to the incidence of general paralysis of the insane. H. Noguchi had found that the incubation period of thicker forms of spirochæte was long and the lesions nodular, hard and sharply defined; with the thinner and more active types, large diffuse lesions were produced. It seemed that deficient early treatment of syphilis was a determining factor in the onset of general paralysis later in life.

Histological Examination of Pituitary Body.

Sir Frederick Mott and Dr. Ida M. D. Robertson contributed an instructive analysis of 110 cases in which the pituitary body of patients dying in asylums and hospitals was histologically examined, the work having been done by Dr. Robertson and verified by Sir Frederick Mott.

The summary of the conclusions was as follows: The cases of tuberculosis showed a certain amount of exhaustion, as evidenced by the breaking up of the cytoplasm of the eosinophil cells, the increase of the chromophobes, and the increased number of nuclei. The intracellular lipoid was also decreased. In general paralysis the lipoid content, in both cells and interstitial tissue, was increased. Cases of dementia præcox showed a marked degree of exhaustion, to almost complete atrophy of the cellular elements of the gland. The distinguishing feature of this, as compared with tuberculosis, was a deficiency of the nuclear chromatin. The association of tuberculosis with dementia præcox, especially with the advanced stages, was very marked, but in one of the most definite cases tuberculosis was not present. With regard to other psychoses, there was, normally, a considerable similarity in structure and staining reactions of the eosinophil cells of the pituitary gland to the interstitial cells of the testes.

Dr. T. Beaton (Bethlem Hospital) contributed an elaborate paper on the

Psychogenic Factor in the Causation of Mental Disorder.

He said that there were two main views of insanity according to whether the causal factors accepted were psychogenic or physiogenic. The issue between these had been unnecessarily complicated by the persistence of the old argument of body against mind. These must not be regarded as separate and opposed, but complemental. He agreed with McDougall that the dominating partner in the trinity of cognition, affection, and conation was conation; that was the thread of purpose throughout the life-history of the organism which bound the successive phases of experience together. He insisted that the psychological description of mental phenomena must have a correlation in nervous function.

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[1] The Lancet, 1922, ii., 127, 231.

Basal Metabolism in Mental Disorders and the Influence on it of the Diathermic Current.

Dr. JAMES WALKER (Cardiff Mental Hospital) read a paper with this title, paying special attention to dementia præcox. Mental and nervous symptoms occurred, he said, as a result of disease of the thyroid gland, but medication with the extract of that gland should only be employed where thyroid hypofunction was considered to be either a causative or a contributory factor. Several cases of dementia præcox he had shown to exhibit vagotonia—i.e., a subnormal body temperature, a tendency to bradycardia, and respiratory arrhythmia. In one or two of these cases examined during remission he had found an improvement in the basal metabolism and a disappearance of the vagotonic symptoms, showing that the oxidation deficiency in the cells was not a permanent condition. Psychic excitement profoundly affected metabolism, and produced a temporary increase in the sugar content of the blood. The most reliable information was yielded by patients in the stupor class, though these need not necessarily be cases of dementia præcox. He did not think the lowered metabolism was due to a diminution of the thyroid principle or autocoid, but to a decrease in all the bodily functions. With regard to treatment, the heat produced by the high-frequency current was endogenous—i.e., produced in the deeper-lying tissues. It produced a slight fall in the systolic blood pressure, an increase in the leucocytes, in the urine, and in the output of urea and ammonia nitrogen. The current produced, in 20 observed cases of mental disorder, an increase of 10 to 15 per cent. in the basal metabolism, 2 to 3 degrees increase in body temperature, and 20 to 30 beats per minute increase in the pulse. His conclusion was that diathermy was a useful therapeutic measure and one likely to play a definite part in furthering recovery. During remission in dementia præcox the basal metabolism approached that of the normal person.

Diagnosis of Dysenteric Infections in Mental Hospitals.

This subject was dealt with in an able paper by Dr. A. A. W. PETRIE, of the Maudsley Hospital. He said the diagnosis of acute cases was comparatively easy; the difficulty lay in the recognition of very mild chronic and latent cases. He first alluded to the causes of non-dysenteric diarrhœa, including tuberculous and nervous mucous colitis, and ulcerative colitis. With regard to the true dysenteries, the tropical dysentery due to the *Balantidium coli* could be excluded as it practically never occurred in mental hospitals. An investigation of asylum subjects showed 9·7 per cent. to be infected with the *Entamœba histolytica*, compared with 4 per cent. to 8 per cent. in the general population. He entered minutely into the differential characters, remarking that the principal bacilli occurring in bacillary dysentery were the Shiga bacillus and the Flexner bacillus, the former usually causing the more severe types of the disease, but the Flexner being the more common organism in asylum dysentery. In the chronic disease, help could be obtained from the agglutinins occurring in the blood.

The Ranchi European Mental Hospital, India.

The PRESIDENT read to the meeting a paper descriptive of the Ranchi Mental Hospital, contributed by Major OWEN BERKELEY-HILL, its medical officer-in-charge. This is the only mental hospital in India intended solely for the treatment of persons of eithe European or American parentage. The hospital i built on the "pavilion" system, and covers 85 acres with ten wards, which will accommodate 92 male an 88 female patients. There is a nurse to every two o three patients and the general health is very good The methods of life and treatment are detailed in th paper in a very interesting fashion.

In addition to other excursions, members visite the Maudsley Hospital, where Dr. EDWARD MAPOTHE explained the work being done there and gave som demonstrations in the laboratory.

ANNUAL DINNER OF THE MEDICO-PSYCHOLOGICA ASSOCIATION.—The annual dinner was held at the Hot Metropole, London, on July 11th, Dr. Edwin Gooda presiding. Dr. Percy Smith, who proposed "The Legislature," gave an interesting sketch of the history of lega restraint in relation to the safety of person and propert The Bill now before Parliament for the admission of patient to county and borough mental hospitals without the formality of certification had, he said, the bulk of professiona opinion in its favour. He expressed the hope that it administration would not prove so harsh as to be anothe form of certification or so exacting as to be another dos of red tape. Lord Onslow, in replying, forecasted th passing of this Bill before the end of the year. The provisions it contained for after-care should often avoid th necessity for further institutional treatment, and faciliti were also given for research in mental disease. Lor Riddell and Sir Sydney Russell-Wells also replie Dr. Goodall, proposing in humorous vein the "Sist Medical Societies," dwelt on the elevating influence of a association of medical men and women. There was, h said, something wrong with the medical fraternity of an community which had no medical society. Sir Humphr Rolleston, Mr. H. J. Waring, Sir William Hale-White, an Dr. Henry Cotton, of New Jersey, replied. Dr. C. Hube Bond proposed "The Visitors," and Sir Eric Geddes "Th Association." Sir Eric Geddes spoke with great sympath of the vast field for research and investigation openin before mental medicine. Quite apart from hopeful lines physical treatment, the aid of psychiatry seemed to hin as a layman, almost unexplored. If the case were pu before the public clearly and definitely he believed th support obtained for the aims and objects of the Associatio would be overwhelming. In spite of the tropical heat th dinner was well attended and most successful.

NATIONAL ASSOCIATION FOR THE PREVENTION OF TUBERCULOSIS.

THE ninth annual conference of this Associatio was held in the University, Edmund-street, Birmingham, on July 12th, 13th, and 14th.

THURSDAY, JULY 12TH.

The conference was opened by the Right Hon the Lord Mayor of Birmingham (Sir David Davis who welcomed all members of the Association to th conference. Sir ARTHUR STANLEY presided over th meeting.

The LORD MAYOR in his opening speech referre to the work done in Birmingham in connexion wit tuberculosis, and mentioned the fact that in thi town, as in a large number of other towns, the campaign against tuberculosis had resulted in a ver definite diminution in the number of new cases the disease. For some three years before the wa there was an average of 4000 new cases of pulmonar tuberculosis reported per annum; last year ther were about 1700. The fall in the mortality had no been proportionately so great because it related t cases which commenced years ago, but at the sam time there had been a decided drop, the rate fo those three years being 0·9 per 1000 of the population. That was a reduction of 60 per cent. i mortality compared with the figure of 50 years ago Fighting consumption was costing Birmingham nearly £90,000 per annum, but if the reduction i the prevalence of the disease be continued then th city was willing to spend the money.

The subject for the morning session was

Care of Advanced Cases of Tuberculosis, especially as regards Prevention of Infection.

A paper on this subject was read by Prof. J. Robertson (medical officer of health for Birmingham), prepared by the medical officer of health for Edinburgh (Dr. William Robertson), who was unable to be present. The opening paragraph of this paper was the cause of much discussion—namely: "It has yet to be realised by sanitary authorities that the segregation of the advanced case of pulmonary tuberculosis is quite as important as is the isolation of small-pox. From some points of view it is more so, because the spread of small-pox can be arrested in an effectual way by definite measures, while the spread of tuberculosis can only be controlled, as far as we know at present, by preventing the diffusion of the infecting micro-organisms." He further stated that there were far too many sufferers from pulmonary tuberculosis, not a few in an advanced stage of illness, wandering about our streets, resorting to places of public amusement, travelling in trains and trams, and freely scattering infection about them. He condemned home treatment when patients were living in overcrowded and insanitary homes totally unsuitable for the isolation of such a dangerous disease. The housing question, he says, is the Alpha of the tuberculosis problem, but when we discuss the advanced case of tuberculosis we reach the Omega of the subject. "A disease that can levy an annual toll of nearly 40,000 persons every year in our country provides an enemy that must be defeated by methods that are at our hands if we waste less time in discussion and get to business. We know that tuberculosis is preventable, and we have seen how better houses will prevent it." Dr. Robertson considered that warrants for the forcible removal to sanatorium of those who cannot with safety be looked after in their own homes, is a measure that will have to be enforced in the near future. "Surely," he added, "we can afford to be drastic when grappling with such a death-dealing malady." Enforced removal of advanced cases also caused much discussion.

In the succeeding discussion Dr. F. N. Kay Menzies (principal assistant medical officer of health, London County Council) stated that he considered the infectivity of tuberculosis had been greatly exaggerated, and this tended to have a detrimental effect on the work of professional men and to discourage voluntary effort. It also made it difficult for the great organisations in dealing with cases, because it carried with it a stigma on the patient which was hard on him in following his occupation in life. He did not agree that the segregation of tuberculosis was as important as that of small-pox. He further stated that 25 local authorities in this country, Birmingham being one of them, had been given the power compulsorily to remove highly infective cases of tuberculosis for so many months. He had asked these 25 authorities how many compulsory removals they had enforced, and the answer in nearly all instances was not more than one or two. The public would never put up with compulsory removal. He did not agree that housing was the Alpha of the tuberculosis problem. If one factor was to be concentrated upon, the most important was food.

Colonel S. Lyle Cummins (David Davies Professor of Tuberculosis, South Wales and Monmouth) said it would be ridiculous to compare the infectivity of tuberculosis with small-pox, and yet the infectivity of tuberculosis was a terribly real and dangerous thing, and it would not do to discard the importance of infection. He considered that the hope for the future lay in the discovery of a specific remedy, a prophylactic vaccine or both. A few months ago such a hope seemed remote. One variety of tuberculin after another had been tried, and the measure of success had not been very great. The last few weeks have opened up for us new vistas of investigation and effort; and once more, as so often in the past, the new light has come from laboratory research. It would be unwise, as yet, to claim that Prof. Dreyer's "antigen" is the long-sought remedy for which we have waited, but it can be stated with certainty that Dreyer has broken fresh ground and that the results already obtained were decidedly in advance of those of any previous worker, and that they are full of hope for the future.

Dr. W. H. Davison (assistant medical officer of health, Birmingham) considered compulsory removal a broken reed, and thought segregation in the home should be encouraged. It was the most humane method. There was a good scheme working in Birmingham at present whereby a patient can purchase a bed by the hire-system or have a bed lent to him free of charge. There were about 700 beds in use under this scheme, which was doing wonderful work in preventing the spread of infection. He considered it better to spend money on the proper methods of preventing the spread of the disease at home than on the cost of maintenance of an advanced case in an institution.

Dr. A. Fergus Hewat (assistant physician, Royal Infirmary, Edinburgh) considered early cases of tuberculosis might be as infective as the so-called advanced case with an old cavity. Patients who were bedridden and were living in small houses in contact with children he advocated should be removed, as also the cases who were disobedient in their preventive training.

Dr. Marcus Paterson (medical superintendent, Colindale Hospital, Hendon) did not agree with compulsory removal except in the case of the "rotter"—i.e., the man who was disobedient and who made no attempt to control infection. He mentioned the difficulty of removing the prejudice of the public against the sputum flask. He has proved this prejudice by travelling to Birmingham with a third-class ticket and a sputum flask instead of indulging in a first-class ticket in order to secure a comfortable journey. He stated that it had been necessary for him to spit into the flask 16 times, but it had enabled him to have a carriage to himself all the way. He thought the conference would do invaluable work if it helped to overcome this prejudice.

Dr. Ernest Watt (medical officer, Scottish Board of Health) gave some interesting statistical data showing the necessity for the removal of advanced infective cases.

Prof. Cawadias (of the University of Athens) told how the disease had been spread in villages in Greece by the return of emigrants. He considered segregation was the course to which reason prompted, but sentiment would not allow them to be too severe.

Prof. J. Robertson (medical officer of health for Birmingham) said that Dr. W. Robertson's statement that tuberculosis was spread as easily as small-pox he felt was not quite correct. He thought, however, that it was very nearly correct, as there was not much difference when they looked at the fact that very nearly the whole of the community was infected with tuberculosis at one time or another.

Dr. Bolton Thomson (Hastings), Dr. S. Barwise (M.O.H. for Derbyshire), Dr. G. C. Trotter (M.O.H. Islington), Dr. F. L. Moore (tuberculosis officer for Northumberland), and Dr. Alex. Collins (tuberculosis officer for West Ham) also took part in the discussion, the majority of them disagreeing with compulsory removal.

The subject for the afternoon session was:—

Extent and Nature of Damage Done by Tuberculosis derived from Infected Milk: Methods of Prevention.

The discussion was opened by Mr. John D. Watson (Birmingham). He explained the work done by the Birmingham Drainage Board to eliminate tuberculosis from the cattle on their farms. The first tuberculin test applied to cows in 1908 showed that 60 per cent. of the milk cows and 12 per cent. of the heifers were tuberculous. Recurring tests gave encouragement to proceed, and they appeared to prove that by the maintenance of consistent procedure it was possible (within four years of its initiation and at trifling expense) to eliminate tuberculosis from a herd of short-horned cows, which on the first test showed 60 per cent. suffering from the disease. To free a herd from tuberculosis, he said, was not enough; you must be in a position to maintain the herd in a healthy state. He concluded by saying that, important as the attitude of the farmer towards this question may be, the lamentable indifference of the public is the ruling factor. If only milk were a clear fluid like water, and if the public could only see what is so frequently offered to them as clean milk—quite apart from the pathogenic character of the fluid which is offered—they would realise the importance of what the hygienist is trying to do for them.

Sir GILBERT BARLING (Vice-Chancellor of Birmingham University) said that tuberculosis derived from alimentation was especially prone to attack children, especially in glands of the neck and abdomen and bone and joint diseases. He was happy to say, however, that these diseases were distinctly fewer than when he commenced practice 40 years ago. He recommended the appointment of a commission on the question of the pasteurisation of milk, and suggested that something could be done in this direction by the conference.

Mr. JOHN FRASER (surgeon, Royal Hospital for Sick Children, Edinburgh) stated that he had analysed figures for the past ten years and regretted to say that he saw no signs of diminution of surgical tuberculosis amongst children. He considered that the increasing incidence of the present day was most likely due to the widespread unemployment and poverty among our hospital classes. He stated that he was a believer in the overwhelming importance of the bovine infection, and claimed that future investigation would show that it is of even greater importance than we now suspect. The elimination of the bovine infection resolves itself into the preservation of milk from infection, and to secure this the proper means is to arrange for the production and the preparation of the milk that the possibilities of contamination be reduced to a minimum. The first essential of a pure milk production, he stated, is a herd of healthy cows, and this could be guaranteed by the institution of periodical tuberculin tests and the immediate elimination of any animals which react.

Sir HENRY GAUVAIN (medical superintendent, Lord Mayor Treloar Cripples' Hospital, Alton and Hayling Island) exhibited some extremely interesting and instructive lantern slides showing what air therapy and heliotherapy had done towards cures of surgical tuberculosis. He believed that 50 per cent. of the cases of spinal caries, lupus, and infected glands were due to bovine tuberculosis, and no form of food-supply had caused more deaths than the milk-supply of this country.

Mr. BRENNAN DE VINE (chief veterinary officer for Birmingham) stated that during the past 15 years 56 herds of cows had been tested, under the Birmingham scheme, and 37·8 per cent. of the animals had been affected with tuberculosis. He stated that in attempting to eradicate a widespread disease such as bovine tuberculosis in this country, assistance should be offered by the State in order to relieve the burden which falls upon the owner of live stock to the benefit of the general community.

Dr. HAROLD SCURFIELD thought that bovine infection of the human being could be stopped if milk were sufficiently heated. The diminution of the mortality rate of non-pulmonary tuberculosis was largely due to the fact that mothers have been giving their children milk which had been rendered safe by heating.

Mr. WILFRED BUCKLEY (of the National Clean Milk Society) Dr. W. T. MUNRO (medical superintendent, Glenlomond Sanatorium), and Dr. J. WHEATLEY (Shropshire) also took part in the discussion, the latter stating that he did not agree with Dr. Fraser's statement that surgical tuberculosis was on the increase, statistics showed otherwise.

Prof. J. ROBERTSON advocated the pasteurisation of milk and stated there had been an enormous reduction in the mortality from non-pulmonary tuberculosis due to better supervision of the infective consumptive and to the strenuous efforts to free herds from tuberculosis. He stated that Birmingham figures show that non-pulmonary tuberculosis was now a little more than one-third as prevalent as it was 20 years ago.

The annual meeting of the Association and conference of branches was held at the University at 5 P.M., and was presided over by Sir ARTHUR STANLEY. After the usual business of the meeting was over a discussion took place on

Work of Tuberculosis Care Committees; and How the Branches of the Association and Other Kindred Societies can Assist.

Dr. FRANCIS J. H. COUTTS (senior medical officer, Ministry of Health) opened the discussion, and was followed by Miss McGAW (member of the Council N.A.P.T.) and Mr. G. W. ALLEN (Director, Tuberculous Ex-service Men's Society). They emphasised the necessity of after-care societies to help patients after discharge from sanatoriums. Temporary financial help was not what Care Committees should give. It was the function of a Care Committee to look upon the family of a consumptive as a unit, the whole income of the family should be considered, and the best means found to assist that family in order to enable the patient to live and work under the most satisfactory conditions possible. The necessity for choosing the right type of women for visitors was emphasised; they should be women with plenty of tact to whom patients could feel they could go as a friend and not as an official.

A reception given by the Lord Mayor and Lady Mayoress was held at the City Art Gallery in the evening.

(To be concluded.)

Reviews and Notices of Books.

THE BLOOD-SUPPLY TO THE HEART.

In its Anatomical and Clinical Aspects. By LOUIS GROSS, M.D., C.M., Douglas Fellow in Pathology, McGill University, and Research Associate, Royal Victoria Hospital, Montreal. London: Henry Frowde and Hodder and Stoughton. Pp. 171. 25*s*.

Dr. Louis Gross's monograph on the "Blood-Supply to the Heart" gives an account of the results of his researches on this subject and the special technique which he has employed. Each chapter also contains a short summary of the work of previous investigators and a sketch of the present state of our knowledge in that particular branch of the subject with which it deals. The material was investigated by means of X ray examination after injection with suitable material, and the hearts were finally cleared in oil and sectioned. In the opening chapter the actual technique employed is described in sufficient detail to enable other workers to carry out the method for themselves.

The most striking feature of the book is an interesting series of photographs, which have been very beautifully reproduced, showing the alteration in the relative richness of the blood-supply to the two sides of the heart at different age-periods. At birth the vascularity of the right and left ventricles is approximately equal, but as age advances a marked left-sided preponderance develops, corresponding to the muscular preponderance which has been studied by Müller and other observers. The relative anæmia of the right ventricle is considered to be a potent factor in the ætiology of those diseases which are most liable to prove fatal in old age. In discussing the blood-supply to the valves of the heart, the author puts forward the suggestive hypothesis that the site of election of valvular endocarditis is largely dependent on the vascularity of the different valves at different age-periods. In fœtal life it is the right heart which is most frequently involved. In adults, on the other hand, although relatively few normal valves show a sculature, it is the aortic cusp of the mitral valve ich most commonly does so, and it is this cusp which nost frequently found to be the seat of endocarditis. her chapters deal with the normal distribution of coronary arteries, the variations which are liable occur, and the veins of the heart. The important estion of anastomosis between the coronary arteries discussed; and in this connexion Dr. Gross lays nsiderable stress on the importance of the increased hness of anastomoses, and the supplementary blood-pply from the *arteriæ telæ adiposæ*, which are present the later years of life.

This book demonstrates the value of radiography in is particular branch of anatomical research, and the aring which anatomy may have upon the clinical oblems of cardiology.

HE SYMPATHETIC NERVOUS SYSTEM IN DISEASE.

Second edition. By W. LANGDON BROWN, M.A., M.D., F.R.C.P., Physician with Charge of Out-patients, St. Bartholomew's Hospital. Oxford Medical Publications. London: Henry Frowde and Hodder and Stoughton. 1923. Pp. 161. 10*s*. 6*d*.

THE first edition of this book received favourable tice in THE LANCET some three years ago. It s been thoroughly revised and new material incor-rated. In its present form it contains a general count of visceral disease in relation to dysfunction the sympathetic nervous system, and is suggestive many instances rather than conclusive. What is cking largely is pathological confirmation of the esumed faults in the sympathetic mechanisms ncerned in disease-production. We are still greatly ignorance whether a strict line can be drawn tween organic and functional sympathetic disorder; hen changes in sympathetic ganglia are found stologically we may still query their relationship the clinical phenomena. The truth is that in the udy of this part of the nervous system a rational npiricism has not as yet been succeeded by a body of ctrine based on pathology. Dr. Langdon Brown clearly aware of the tentative nature of some of his nclusions and admits that some of the views rather favour to-day are no more than plausible specula-ons. A beginning has been made, none the less; e sympathetic system is no longer a terra incognita, d the clinician is justified in seeking an explanation various clinical types in impairment of sympathetic nction, however far it be from the stage of objective roof. The book has a good index and useful references the literature at the end of each chapter.

HRONOLOGIA MEDICA.

A Hand-list of Persons, Periods, and Events in the History of Medicine. By Sir D'ARCY POWER, K.B.E., F.R.C.S., and C. J. S. THOMPSON, M.B.E. London: John Bale, Sons and Danielsson, Ltd. 1923. Pp. 278. 10*s*. 6*d*.

THIS is an excellent and useful little book, ough as the authors say in their preface the bio-raphies are not intended to be complete, nor does e list purport in any sense to be a history of edicine. But it contains a vast amount of informa-on and, we must add, some curious omissions. here is no mention of John of Burgundy, otherwise ohannes de Barba, or John Burgoyne, who may ave been the author of Mandeville's travels and ho is well known as the author of a treatise upon e Black Death of 1348, many MSS. of which are British libraries. Still more strange is the omission f any mention of Victor Horsley. But there are also ntries of the names of comparatively unknown ioneers in sundry branches of science, such, for stance, as that of Henry Hickman (1800–1829), a eneral practitioner of Ludlow, who carried out xperiments on animals under anæsthesia by nitrous xide in 1828. Chronologia Medica may be proud f noting him, for his name has escaped the nets both of the Dictionary of National Biography and of Garrison's History. Another interesting entry is that of Adamantios Koraes, otherwise known as Coray, who was a Greek and M.D. of Montpellier (1748–1833). He was a translator of medical books, who left a vast accumulation of notes for an edition of Hippocrates, and he edited the treatise "Airs, Waters, Places," an edition held to be the best extant. On p. 101 we find the following, which, though not exactly inaccurate, is a very loose statement. "1547 St. Mary of Bethlehem Hospital for the Insane founded in London, though Bedlem had been used as an asylum since 1377." An uninstructed reader coming to this passage would imagine the Hospital of St. Mary of Bethlehem and Bedlem to be two different institutions; he would also not gather that the Hospital of St. Mary had really been founded in 1247 as a priory and was first called "hospital" in 1329. The "foundation" in 1547 was of the same nature as the "foundation" of St. Bartholomew's Hospital in 1546, a grudging return of property grabbed by Henry VIII. at the beginning of the Reformation. On p. 45 we note that the elder Bachtishua has his Christian name transliterated as Dschordschis. Why the authors went out of their way to print this queer combination of letters when the simple word "George" would have answered all purposes we do not know. We imagine that it is a French transliteration of the name "Georgees" (to spell it phonetically). Despite these blemishes the book will be found a valuable compilation.

ATOMS.

By T. C. WIGNALL and G. D. KNOX. London: Mills and Boom, Ltd. 1923. Pp. 288. 7*s*. 6*d*.

THIS is a brave attempt, and a very considerably successful one, to explain in popular terms the structure of the atom so that the mystery in which its potential energy is enveloped may be to some extent straightened out for the unscientific. The opening chapter plunges us straight into the story when two of the characters sitting in a railway carriage discuss the possibilities of a *sou* found in the train. Says one of them, "About the most worthless thing one could discover," to which the other replies, "It contains energy equal to 80 million horse-power." The gentleman who thus spoke was "a Johnny on the point of harnessing the atom" according to a popular description of some of his fantastic theories, and he proceeds to explain in simple language, as far as such language will cover the ground, what is meant by atoms, molecules, and electrons, incidentally alluding to the fact that a Greek financier, who is striving to corner the output of the electric workshops of Europe, is anxious to have him for a partner on the ground of his written views. Thereafter follows a thoroughly exciting and well-planned sensational novel, in which the idea is to show what would happen if the atom could be successfully broken up and unlimited energy thereby obtained. As far as has been possible, in dealing with such a theme, the intention has been to be simple, and many associated theories and modern developments have been strictly left on one side. And why not? For, after all, the study of the structure of the atom is extremely recent work, and it is quite likely that some of the results of that work will be found far more valuable than others, while new ideas may be found passing from the realm of fancy to the realm of accepted fact at any moment. It is an excellent notion to familiarise the reading public with the great conceptions of science. It is always quite impossible to follow these great conceptions in laboratory terms, even if the author has the technical qualifications for such writing, unless the reader is an advanced thinker and practical worker himself. To such "Atoms" may or may not appeal. But for a less-equipped audience it may be said that the reading of this novel will place intelligent persons in a position to understand the direction of much modern work and some of its tremendously important meaning. They will be helped to reach this position by a well-planned story of adventure, and we have no hesitation in recommending its perusal.

ENDOCRINE GLANDS.

Einführung in die Klinik der Inneren Sekretion. By Prof. Dr. G. PERITZ, Nervenarzt in Berlin. Berlin: S. Karger. 1923. With 31 illustrations. Pp. 257.

AMONG various contributions to our knowledge of the endocrine glands and their disorders Dr. Peritz's monograph should take a worthy place. Didactic rather than critical, it contains a fair schematisation of present-day knowledge, which is dealt with under the headings of pituitary, pineal, gonads, adrenals, pancreas, thyroid, parathyroids, and thymus respectively; pluriglandular syndromes receive consideration, on a somewhat meagre scale, while attention is also given to the difficult question of the interrelation of the ductless glands and the nervous system. There are very many references to the appropriate literature of the topics handled, but none to the sources of information, which is matter for regret and detracts from the usefulness of the book. Tables of symptoms and classification of syndromes help the reader to systematise his knowledge.

EPIDEMIC ENCEPHALITIS.

L'encéphalite épidémique. By Dr. LOUIS REYS. Paris: A. Maloine et Fils. 1922. Pp. 144.

THIS brochure is a clinical study of 150 cases of epidemic encephalitis which occurred in Strasbourg and in Lower Alsace during the period 1919–21. The writer, as Chef de Laboratoire in the Neurological Clinic of the Faculty of Medicine at Strasbourg, had opportunity for carefully recording the clinical phenomena exhibited by the cases and for tracing the tragic after-effects of the malady; from this aspect his study is a fairly complete and useful one. Like some other French authors, Dr. Reys errs, in our opinion, in an over-elaboration of clinical types. Such complexity of classification tends to bewilder the student, whilst those who have investigated similar epidemics deprecate the exaltation of one particular sign or symptom—which, in varying degree, may be seen in all forms of the disease—into the artificial picture of a type. Vertigo frequently occurs in epidemic encephalitis; it is true that when associated with ataxy it may indicate the involvement of the cerebellum, as the histological work of Marinesco proved in 1918, but we hesitate to believe with Dr. Reys that vertigo with ocular disturbances constitutes an essential labyrinthine form of encephalitis, or that further subdivision may be made into pure and associated varieties. In the clinical after-effects noted in this Alsatian outbreak most of the forms so admirably investigated by Mlle. G. Lévy at the Salpêtrière were observed. Of the cases with post-encephalitic sequelæ, paralysis agitans amounted to 40 per cent. approximately; the majority of cases occurred immediately or within one year after the acute attack.

OCULAR NEUROLOGY.

Manuel de neurologie oculaire. Second edition. By F. DE LAPERSONNE and A. CANTONNET. Paris: Masson et Cie. 1923. Pp. 416. 20*s.*

IN this, the second edition of an extremely useful work, the authors have succeeded in producing a valuable and up-to-date treatise on ocular neurology, which cannot fail to appeal both to the student and to the practitioner. The book is divided as before into two parts. The first deals in an admirably clear and detailed manner with the anatomy and physiology of the nervous mechanism of the eye, with the symptomatology of its various pathological states and with methods of clinical examination. The second part, which has been enlarged and brought up to date, contains an account of the ocular manifestations of various nervous and general diseases. This section would bear still further amplification.

The book strikes us as being primarily suited to the student. The anatomical descriptions are particularly lucid and good, though we venture to disagre with the rather low value (21°) given for the angl between the orbital axis and the mid-line. We shoul also like to have seen a fuller description of th mechanism of production of the various clinical sign Of course this must be very largely controversial, bu it would add much to the interest of the work if th realms of hypothesis were occasionally entered. Fo example, the student would be more likely to remembe the existence of the Tournay reaction if he were give some idea, even if necessarily purely speculative, of it mechanism. The illustrations are good, with the exception of the two presentations of the fundus oculi, whic might with advantage have been replaced by plate from any standard text-book of ophthalmology.

DISEASES OF THE HEART.

Herzkrankheiten. By Privatdozent Dr. I SCHRUMPF, Assistent am Med-poliklinischen Institu der Universität Berlin. Leipzig: Georg Thieme 1922. Pp. 200. 4*s.* 7*d.*

THIS book, it is stated, is intended for the studen and the general practitioner, and for further information on the subject the reader is referred to the author larger work "Klinische Herz-diagnostik," 1919. Th first two chapters set out anatomy and clinica methods for investigating the heart. The next 1 chapters deal with diseases of the heart, and the fina chapter discusses treatment of the various forms o heart disease. The description of methods is meagre and not sufficiently explicit to be of use to those wh would be likely to read such an elementary book The chapters on diseases of the heart are clear an readable, but require to be supplemented by the us of a larger book. The value of the tracings reproduced, which are drawings of the originals, i diminished by the unfortunate absence of tim markings.

On the whole, considering the brevity of the volume the author has selected wisely.

AUTOBIOGRAPHICAL STUDIES IN MODERN MEDICINE.

Die Medizin der Gegenwart in Selbstdarstellunge Vols. I. and II. Edited by Prof. L. R. GROTE Privatdozent at the University of Halle. Leipzig Felix Meiner. 1923. Vol. I. Pp. 239. 8s Vol. II. Pp. 250. 8*s.*

Prof. Grote's personal contribution to the firs volume is limited to an 11-page introduction in whic he points out that the history of medicine, lik history in general, is the record of its great men. T attempt to sketch the development of medical scienc as an impersonal thing would be not only to rob i of colour, but also of form. So he has induced six o his most prominent colleagues to give short autobiographical records of the parts they played i developing their respective specialties. After hi prologue, the editor retires, and the rest of the boo contains the life-histories, with portraits, of Alfre Erich Hoche, Hermann Kümmell, Felix Marchand Friedrich Martius, Wilhelm Roux, and Robert Wiedersheim. The second volume includes autobiographie of Dietrich Barfurth, Paul Grawitz, Ferdinan Hueppe, Hans Horst Meyer, Franz Penzoldt, F. Juliu Rosenbach, Friedrich Schultze, and Hugo Schulz. I is probable that the information thus provided durin the life of, and by, the person concerned is mor reliable than the average obituary notice which is s often stultified by blind observance of the rule "D mortuis . . . ." But though a biopsy may yield fulle and more accurate information than a necropsy, ther are certain difficulties attached to the former method however anæsthetic the auto-vivisector may be. Th six leaders of the medical profession who have turne their insides out for the benefit of their colleagues ar to be congratulated on the conscientiousness and skil with which they have performed their allotted task To be at once truthful and modest in such a matte must be very difficult indeed.

THE LANCET.

LONDON: SATURDAY, JULY 21, 1923.

RESEARCH IN MENTAL DISEASE.

THE Medico-Psychological Association of Great Britain and Ireland completed last week in London its eighty-second annual meeting. The atmosphere of the meeting was one of expectancy; at the annual banquet Lord ONSLOW expressed his belief that the Mental Treatment Bill would become law before the end of the year, when the Statute-book would no longer recognise the term "lunatic asylum." Sir ERIC GEDDES, speaking impressively on the same theme, was sure that the use of the term "mental hospital" would greatly benefit the attainment of the objects of the Association. He alluded to the vast field for research, for investigation, for treatment, and for cure, now open to the mental hospitals if adequately supported; if the case were put before the public clearly and definitely the response, he said, would be overwhelming. Every alienist knows that research must come first and provision has actually been made for research in the Bill. Dr. EDWIN GOODALL's presidential address to the Association was largely taken up with an inquiry into the rôle played by toxic bodily conditions in disorders of the mind; and Dr. HENRY COTTON, lecturer in psychopathology at Princeton University, made a very convincing statement of his own experience in regard to chronic sepsis. Five years given up to the study of endocrine disturbance and gland therapy in functional mental order had led him to no decisive result, but eradication of chronic sepsis had been rewarded by an immediate increase in the recovery rate of his patients from 37 to 85 per cent., so that he had come to regard disease of the brain tissue as the fundamental condition, and psychogenic factors as precipitative rather than causative of psychosis. Other notable contributions at this meeting were Dr. C. LOVELL's discovery in anxiety cases of increased nucleation of the interlobular connective tissue of the pancreas, an observation by Sir FREDERICK MOTT and Dr. IDA ROBERTSON of complete atrophy of the cellular elements of the pituitary body in dementia præcox, and Dr. J. WALKER's demonstration of vagotonia in the same condition.

Already a number of mental hospitals have appointed an additional medical officer, whose time will be devoted chiefly or wholly to pathological investigations. There are a few examples, among which Cardiff City Mental Hospital is perhaps the most noteworthy, of institutions possessing extensive laboratories and a comparatively large staff of investigators. In a large hospital, especially in one connected with a university, such a development of this side of the work is eminently desirable and feasible. It is impossible, however, for work of this nature and extent to be undertaken in every mental hospital in the country; routine work of a simple nature can be undertaken with advantage, but more difficult work must often be sent elsewhere, and deliberate research will demand facilities which are available only in specially equipped laboratories. These considerations have led to the establishment of central laboratories designed to serve a group of mental hospitals. An example of such work is afforded in the thirteenth annual report of the Scottish Western Asylums' Research Institute. Much of the work done during the year has been of a routine nature, and medical officers from the asylums interested have attended the institute in order to acquire a knowledge of laboratory technique. At the same time several lines of research have been followed—mainly of a chemical nature, including an investigation of the blood-sugar content in emotional states, and determination of the basal metabolic rate in dementia præcox. In some cases where the underlying cause appeared to be infective, autogenous vaccines have been prepared, and an attempt was made to influence conditions apparently due to intestinal auto-intoxication by administering milk soured by the *Bacillus acidophilus*. This interesting experiment yielded improvement in general health, although no effect was observed on the mental condition of the patients.

A similar venture on a somewhat larger scale is represented by the Birmingham Pathological Laboratories at Hollymoor Mental Hospital, which have been established by the Joint Board of Research for Mental Disease, and were opened at a meeting held on June 16th, attended by the Minister of Health. These laboratories, which are under the direction of Sir FREDERICK MOTT, are equipped for all varieties of work, and for purposes of routine investigation are intended to serve the mental hospitals of the Midlands. Mental hospitals are invited to coöperate, either by making an annual contribution or by sending material for examination at charges to be fixed by arrangement. At present there are, unfortunately, legal restrictions which prevent the authorities of mental hospitals from contributing adequately to such a scheme as this, and the Birmingham laboratories are dependent in part on funds which have been raised privately. The present arrangements are regarded as only a beginning, and it is probable that the department will be transferred later to the Birmingham University Laboratories, where the work will be in direct association with the general pathological work of the University.

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THE INTERNATIONAL CONGRESS OF SURGERY.

THE International Society of Surgery has just concluded in London its Sixth Triennial Congress. We are able to print this week a report of the inaugural session at which the delegates were officially welcomed and Sir WILLIAM MACEWEN delivered a presidential address, and of the first scientific session which was devoted to reports and discussion on the surgery of endocrine glands. We have had among us a body of men whose names are household words in their profession. Twenty-four countries, ranging from Roumania and Poland to Chili and Peru, have sent their greatest surgeons to tell us of their discoveries, to inspire us with their own enthusiasm, and to stimulate us to emulation. In the amazing progress which surgery has made in the last 30 years Britain has taken her full share, and the sons of HUNTER and of LISTER are not unworthy of their great ancestry. But just because British surgeons have striven to keep in the van, they are the better able to appreciate the great men of other countries who have fought so hard to wring from Nature the secrets of their art, and they are the more eager to applaud the victories they have won. Towering above them all in age and experience, the very Nestor of surgery, is William Keen. Eighty-six years of life and 64 of surgery have still left him young, and it is difficult to realise that he was a pioneer in America when Lister was still feeling his way towards antisepsis, and when abdominal surgery was a distant dream. William Mayo, of Rochester, the head, with his brother, of the greatest surgical organisation in the world, brings with him Donald Balfour, one of his ablest captains. From its vast resources the Mayo Clinic provides a formidable proportion of the surgical literature of the world, and we owe no small part of modern abdominal surgery to its leaders. Representing American orthopædics we have Edville G. Abbott, who has done so much to improve the treatment of spinal curvature. Charles H. Frazier represents neurology, and to him we owe many ingenious methods for dealing with the difficult problems presented by the gasserian ganglion and pituitary tumours. George Crile has come to teach us how to operate by stealth, so that even the subconscious nervous system of the patient may not be injured by the operation which he cannot feel. From Canada we welcome Frederick G. Banting, whose discovery of insulin has revolutionised the treatment of diabetes and given a powerful stimulus to the study of the endocrine glands. France has always been famous for her surgeons, and her list includes many familiar names. Theodore Tuffier calls to mind brilliant advances in thoracic surgery, A. Gosset and René Leriche in the surgery of the peripheral nervous system. Henri Hartmann in gynæcology and Louis Bazy in the urinary tract are masters, whilst to De Martel we owe a whole range of ingenious instruments which he applies with exquisite skill in the surgery of the brain. Belgium sends us Charles Willems, whose daring methods of treating war infections of the knee by mobilisation revolutionised our outlook on the surgery of septic joints, and Albin Lambotte, one of the pioneers in the surgery of the bones and in the operative treatment of fractures. Prof. V. Putti, from the famous school of Bologna, has shown us how to obtain from amputation stumps movements never before thought possible. From Berne, made famous by Theodor Kocher, comes Fritz de Quervain, to whom we owe a brilliant book on surgical diagnosis, and who is one of the greatest living authorities on endemic goitre. A few names chosen at random from a long list can give little idea of the brilliant intellects who have met at the Congress. Still less can a few short sentences give any adequate conception of the treasures which years of labour have enabled these men and their colleagues to hand down as a priceless possession to posterity. The surgeons of Britain are indeed proud to welcome a body of men, every one of whom has added lustre to a great profession, and the people of Britain will rejoice that through the lips of our own Prince Ambassador they were able to pay homage to those whose devoted labours have won such blessings for humanity.

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THE SPAHLINGER TREATMENT.

The paper on the Spahlinger vaccine by Dr. E. H. Colbeck and Dr. S. Roodhouse Gloyne, and the letters on the same subject published in this issue of The Lancet add a good deal, but not as much as we want, to our knowledge of this subject. We are told of the results, immediate and late, of this treatment in a considerable number of cases, and we are left by Dr. Colbeck and Dr. Gloyne to draw our own conclusions. In withholding the panegyric with which new remedies are usually ushered into the world, they have acted with wisdom as well as with restraint, and have proved themselves conversant with the history of therapeutics. The usual record of a new remedy may be illustrated as a tracing—a sharp rise, a culmination of brief duration, and a slow decline ending either at a low level or, sad to say, in the base line of oblivion. This last is the fate of many remedies as we all know. Yet the incorrigible optimism of man is doubtless an asset to the race, and the indiscriminate scepticism of the senior medical student towards the youthful therapeutic enthusiasms of his teachers is sometimes ill-founded. We may then do well to scrutinise the evidence supporting the Spahlinger case before we discard it as unproven. A perusal of the cases hitherto published brings out one very important point. They were, as a rule, advanced cases, and in many the disease was active as well as advanced. To undertake the cure of an early case of tuberculosis is often like rushing to the aid of the victor; it is not infrequently a work of supererogation. During the recent tuberculin revival, "cures" were effected in persons whose only sign of tuberculosis was a positive tuberculin reaction. If, and we would emphasise this *if*, the Spahlinger treatment is uniformly and permanently beneficial in febrile cases with signs of advanced pulmonary disease, then the viability of this treatment is assured. But, considering how erratic the course of even advanced and febrile pulmonary tuberculosis may be, we must have many more records than we possess at present of the results of this treatment ; the *ex uno disce omnes* principle must be reversed Another point is concerned with the experimental evidence in the case. Is it supported by controlled guinea-pig and other animal tests? More human beings recover from, than die of, infection with the tubercle bacillus, and man is therefore for this, as well as other reasons, an unsuitable test subject. But the guinea-pig experimentally infected by the tubercle bacillus almost invariably dies in a few months. Has the tuberculous guinea-pig been cured by the Spahlinger preparations?

The problems of tuberculosis being already singularly intricate and confused, it is a pity that, so far as the Spahlinger treatment is concerned, confusion has been worse confounded by the secretiveness which has marked its production and its methods for distribution. Had Mr. Spahlinger published his researches from time to time, they could have been checked by other workers, and much valuable time would possibly have been saved. At present we do not even know whether the composition of the vaccines and serums now trickling out in a fitful stream from the Spahlinger laboratory is that of the vaccines and serums which were, apparently, very effective in 1914. We are given highly laudatory reports from physicians who have visited Mr. Spahlinger in Switzerland, but all these visitors were not expert pathologists, serologists, and bacteriologists. Even if they had been thus qualified, how could they judge of the value of a remedy, the manufacturing processes of which were jealously guarded? These visits of inspection were little short of farcical what time the actual methods of production were kept secret. The physicians who have returned from their tour of inspection with the docile fervour of a religious pilgrim have, of course, acted with perfect honesty, and who shall blame them for that faith which accepts as gospel "the evidence of things unseen"? But those of us to whom this kind of faith is denied will suspend judgment until such time as sufficient of the remedy has been submitted to one or other of the research institutes which have made no secret of their willingness to supervise a valid test.

Annotations.

"Ne quid nimis."

MEDICAL EXAMINATIONS FOR MOTOR DRIVERS.

Complications which may arise from the new legis-ation as to medical examinations for motor drivers and et out in our Paris letter, June 30th, are well discussed n a recent number of *Le Scalpel* (vol. lxxvi., p. 289). What, for example, is the physician to do who is onsulted by an epileptic chauffeur ? If the chauffeur nsists on continuing his employment, the physician s faced with the disagreeable alternatives of warning he chauffeur's employer or being held responsible for ome fatal accident at a later date. The problem is almost as delicate as that which often arises in connexion with venereal disease, and it raises the question f compulsory health certificates for motor drivers. Among the proposals recently made to the Academy f Medicine in Paris it was suggested that no such icence should be given to anyone under the age of 21, hat chauffeurs suffering from faulty vision or hearing should be subjected to a medical examination by a specialist every year, and that no licence should be given to anyone without a medical examination at which the heart, the arterial pressure, and the functions of equilibrium and coördination have been found to be in good order. The first of these three requirements seems to be over-shooting the mark ; many fools remain reckless all their lives, and many persons are level-headed while still in their teens. But the other two conditions are worthy of serious consideration ; after a recent accident it transpired that the owner-driver of a car was totally deaf, being accompanied on that occasion by his wife, who was also deaf, and it would be well if such diseases as epilepsy, chronic alcoholism, and addiction to drugs were made disqualifications for driving licences. The objection may be raised that even if medical examinations were enforced as a step to qualifying for a driving licence, diseases such as addiction to drugs could easily be concealed, and the true facts of the case might not be revealed till an inquest was held on the driver's victim. But even if the mesh of the medical examiner's net were to prove too coarse for certain slim applicants for driving licences, it would yet serve a useful purpose in discouraging some of the least physically fit from applying for a licence. It would, of course, be possible by a medical examination to give only a partial guarantee of physical and mental fitness ; a driver may be physically and mentally fit enough to amble at ten miles an hour through a deserted country lane, whereas he may break down in congested traffic. At an inquest recently commented on in a leading article in the *Manchester Guardian*, the driver's excuse for the accident was, "I completely lost my head." As pointed out in the journal, the driver would probably have been able to pass any likely official test in the week before the accident. It is evident, therefore, that no tests, medical or other, can guarantee a fool-proof state of affairs, but it would be well if efficiency tests for motor driving were made as searching and stringent as possible.

PUERPERAL MORBIDITY.

Dr. Eula Eno,[1] of Des Moines, Iowa, has made a study of puerperal morbidity based on the records of about 7000 cases equally distributed between intern and extern practice at the Woman's Medical College of Pennsylvania during the period from 1906–1921. The English standard of morbidity was chosen according to which any puerperal case is regarded as morbid in which there is a rise of temperature to 100° F. for three successive days or longer. In the total of 3500 intern patients there were 300 cases of puerperal morbidity, or 8·6 per cent., with 10 deaths ; 202 were primiparæ and 98 multiparæ—a percentage incidence of 11·5 and 5·6 respectively—so that puerperal morbidity is twice as common among primiparæ. In the extern practice there were 71 cases of morbidity, or 2·0 per cent., with no deaths ; 23, or 3·2 per cent., were primiparæ, and 48, or 1·7 per cent., multiparæ. A study of the morbidity during each of the five-year periods shows a progressive fall in the incidence, the percentage in the intern practice being 11·3 in the first period, 9·7 in the second, and 7·5 in the third, while in the extern practice the incidence fell from 2·16 per cent. in the first period to 1·6 per cent. in the third. There was a definite increase in morbidity in non-operative cases in primiparæ as compared with multiparæ, which was probably due to the influence of protracted labour and repeated vaginal examinations. Gonorrhœa played a considerable part in the causation of morbidity, as there was either bacteriological or definite clinical evidence of that disease as an ætiological factor in puerperal morbidity in 36 per cent. of primiparæ and in 20 per cent. of multiparæ. In a large class ranging from 33 to 75 per cent. of the total patients, in which the symptoms were very mild, no definite ætiological factor could be found. There was a definite drop in the incidence of post-operative morbidity, but it was less than that of non-operative morbidity. The operative procedures succeeded by morbidity were as follows in decreasing order of frequency : intra-uterine douche, version and extraction with craniotomy, manual removal of placenta following some other procedure, insertion of bag following some other procedure, Cæsarean section, version and extraction, high forceps, mid forceps, breech extraction, low forceps, manual removal of placenta, insertion of bag, the sequence being practically the same in intern and extern practice.

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[1] Surgery, Gynecology, and Obstetrics, June, 1923.

A MEDICAL GATHERING AT THE SOUTH LONDON HOSPITAL.

Pleasure before business was an excellent hot weather rule at a meeting of the London Association of the Medical Women's Federation which was held at the South London Hospital for Women on July 10th. Refreshed by a strawberry tea in the hospital gardens at 4.30, nearly all the guests willingly undertook a climb to the roof preliminary to inspecting the hospital under the guidance of Miss M. M. Chadburn, its senior surgeon. It will be remembered that the hospital was founded and incorporated in 1912 to make further provision for medical treatment of women by members of their own sex ; to provide, in addition to ordinary hospital accommodation, private wards for women of limited means at low inclusive fees ; and to afford further scope for post-graduate training for medical women. The hospital overlooks Clapham Common, and is equipped not only with what have come to be considered the essentials of a modern hospital, but with those amenities which do much to minimise the differences between hospital and home. For example, the lack of some privacy in hospitals is a source of dismay both to probationers and to new patients, though it may be admitted that both classes of inmates soon get accustomed to living in close community with their fellows. At the South London Hospital, however, there are not only separate bedrooms for nurses but cubicles for wardmaids, while besides big wards single rooms are provided for patients at 6 guineas a week each, double rooms at 4 guineas, and cubicles at 5 guineas. The ancillary departments—X ray, electrical, dispensing, and pathological—are well disposed, the last-named block being especially light and airy. Practically all the wards have large balconies which are specially appreciated in the treatment of children. The admirably appointed kitchens and the boiler room with duplicate plant were open for inspection. As to clinical work, operations were being performed in the theatre by Miss E. Davies-Colley, and before the business meeting which concluded the programme some interesting cases were shown. These included cases under insulin treatment, shown by Dr. M. G. Thackrah, and a case of splenic enlargement for diagnosis, by Dr. A. M. Hutchison; a case of ovarian tumour simulating pregnancy by Dr. Frances Huxley; triplets, all with congenital hearts, by Dr. Helen Ingleby; and a case of mental deficiency with catatonia in small child by Dr. E. M. Pickard. Miss E. C. Lewis showed specimens of double ureter attached to a kidney with partial hydronephrosis, ureteric calculi, and pyelograms, while Dr. Hilda Whittingham had on view interesting slides of tumours of doubtful malignancy. These absorbing side-shows, while leading to much valuable discussion, were not allowed to detract from the holiday atmosphere of an afternoon almost in the country, for though easily accessible from central London the hospital appears to be surrounded by much open space. Altogether it was a most cheerful function. Dr. Louisa Martindale, supported by Lady Briscoe and Dr. Amy Sheppard, expressed the thanks of the Association to the medical and nursing staff for their hospitality, and more than one guest was heard to hope that the opening of the new surgical block, now in process of construction, would give occasion for another medical garden party at the South London Hospital for Women.

IS REINFECTION OF TUBERCULOSIS FROM WITHIN OR FROM WITHOUT?

Could this question be definitely answered, one way or the other, the problems of tuberculosis, notably those concerned with prophylaxis, would be greatly simplified. If the Andvord-Römer hypothesis is correct, and the active pulmonary tuberculosis of adult life is merely the final stage of a long and consecutive train of events beginning with infection in childhood, the adult who gives a positive tuberculin reaction has little to fear from contact with sputum-positive cases of tuberculosis. To most rules there are exceptions, and in his latest communication Dr. K. Andvord has clearly pointed out that he does not regard the risk of exogenous infection among adults as perfectly negligible. Dr. Braeuning,[1] of Stettin, seems, however, to have come to the conclusion that exogenous reinfection is not merely of occasional, but of common occurrence. His opinions are founded on statistical observations which, though open to criticism from several points, are exceptionally interesting and instructive. Several lines of research were followed. First he took stock of the 244 families in Stettin, in each of which there was a case of open tuberculosis notified in 1919. There were 1077 persons in these families—i.e., there were 833 contacts. What, he asked, was the incidence of open tuberculosis among these contacts during 1919, 1920, and 1921 as compared with that of the whole population of Stettin? The answer was illuminating. Among the contacts there were 27 new cases of open tuberculosis in the three years under discussion—i.e. 32·4 per thousand. In the same period in the general population this ratio was only 5·4 per thousand. In other words, the incidence of new cases of open tuberculosis among the contacts was between five and six times as high as in the general population. Dr. Braeuning discusses various sources of error in his comparison, and he notes that as these errors did not operate only on one side, they tended to neutralise each other, and were in any case negligible in view of the striking differences in the two tuberculosis rates. He has, however, omitted to mention one important factor or possibility which might bring the Andvord-Römer hypothesis in line with his own findings. The 27 persons who developed open tuberculosis within a few years of the notification of an earlier case in the same house may have been exposed to the same infection many years earlier—in childhood. If, for example, a man, aged 25, develops pulmonary tuberculosis in 1919, and his sister, aged 23, develops the disease in 1920, and it transpires that their mother died of pulmonary tuberculosis when they were still infants, who shal say that the sister contracted the disease from he brother in 1919 and not from her mother two decade or more earlier?

Dr. Braeuning was not, however, satisfied with only one line of research. He grouped his contacts in fou classes, according as the hygienic conditions unde which they lived were good, bad, or somewhere between these extremes. There were 218 persons living unde good conditions, save that they were in contact with a case of open pulmonary tuberculosis. Only 1·3 pe cent. of these contacts developed open tuberculosis in the period 1919–21. But of the 122 contacts living under the most unhygienic conditions, as great a proportion as 4·9 per cent. developed open tuberculosis in the same period. At a casual glance these figures certainly suggest that particularly favourable opportunities for exogenous reinfection explain the marked differences in the number of new cases of tuberculosis in the two classes. But the matter is not really so simple. For contacts living in poverty, dirt and squalor are subject to many noxious influences besides that of massive infection, and these other influences cannot be dismissed as negligible. The contact living in hygienic surroundings is probably receiving better pay, is less overworked and underfed than his fellow-contact in a slum. And, it may be argued, he is comparatively immune, not because infection is less massive in a clean than in a dirty home, but because his opportunities for maintaining acquired immunity are comparatively great. A third line of research open to the same criticism as the first was an inquiry by Dr. Braeuning of 100 patients suffering from open tuberculosis as to their having been in contact with cases of pulmonary tuberculosis shortly before their own disease developed. The same question was addressed to 100 non-tuberculous patients. A history of exposure to infection was obtained between two and three times as often (2·7 to be exact) in the first as in the second class. Dr. Braeuning argues that all his lines of research converge on one point; exogenous re-infection of tuberculosis is very common. It may be. But valuable as Dr. Braeuning's researches are, it cannot be claimed that they are the last word in this matter and a complete answer to the heading of this annotation.

A TRIBUTE TO THE MAYO CLINIC.

At a Congregation of Leeds University, held on July 13th in the School of Medicine, the honorary degree of Doctor of Science was conferred by Sir Michael Sadler upon Dr. W. J. Mayo of Rochester, Minnesota. In presenting Dr. Mayo, the Dean of the Faculty of Medicine, Prof. J. K. Jamieson, spoke as follows:—

The remarkable institution called the Mayo Clinic in Rochester, U.S.A., emanates from the brains of the Mayo family, father and sons. Even were it permissible to describe it in a degree oration, that could not be done in the Latin or English forms in use in our universities; it would require the happy amœbic pseudopodia of ancient Greek or the still developing collateral anastomoses of the American language to give a true idea of the development of the institution.

It stands now as a colossal monument of organising ability founded on the sure rock of tireless work carried on with faith and enthusiasm. It is a notable illustration of what may be done by devoted coöperation. As there is nothing new under the sun one desires to seek its prototype in history. If there be a prototype it is in the Temple of Æsculapius at Kos. We do not know that this ever contained more than the spirit of a genius, and the Mayo Clinic fortunately possesses the body as well; but imagination allows us to draw a picture illustrating the resemblance. Were some catastrophe to dismember civilisation it is quite possible that Rochester would become the second Kos. Therein we might find the buildings tenanted by priests clad in white vestments and masks performing a ritual reminiscent of the surgery of the early twentieth century, and receiving from the faithful tithes of the flocks and herds and corn and oil, and—may we say—wine.

The creation and development of an organism which is a fountain of progress in surgery flowing all over the world is surely good reason for our desire to honour its Director;

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[1] Beitr. z. Klin. d. Tuberk., 1923, Bd. lv., Hft. 2.

here in this room we are not the whole Congregation. are surrounded by the faces of the unforgotten dead who uire of us that we accord no honour to success unless that cess has been attained with due regard to certain ancient nciples which are still the glory of the profession.

will therefore say—firstly, that every new fact uncovered l every new idea conceived in Rochester has been freely l promptly communicated to the profession, and the ole surgical world have been free students of the Mayo nic; secondly, that the inheritance of an ancient obligation been faithfully accepted and the afflicted poor have a erous share in the benefits of the institution; thirdly, that cess and praise have in no way misguided the workers in ir quest for perfection. Emerson has said that if a man do something, even the making of a mouse-trap, better in anyone else, no matter where he hides himself, the rld will make a beaten path to his door. Mayo has ved this true, but those who know him know that no one more likely to slip into the Surgeons' Valhalla murmuring ologies for the quality of *his* mouse-trap; and lastly, that work of this notable family has contributed substantially the diminution of that terror of the knife which has herto added so much to the distress of afflicted humanity.

Therefore, Prof. Jamieson concluded, it is not only the promoter of a colossal enterprise and as a stinguished figure in surgical research, but as a true an, modest, charitable, and humane, that in the name this Congregation I present to you William James ayo for the Degree of Doctor of Science.

THE BEIT MEMORIAL FELLOWSHIPS.

AT a recent meeting of the trustees of the Beit emorial Fellowships for Medical Research, Sir mes K. Fowler, the honorary secretary, presented review of the fellowships from their beginning in 10 to 1923. During that period, said Sir James wler, 79 fellowships had been awarded; but r the war this number would have been nsiderably greater. In 1914 nearly the whole dy of Fellows resigned in order to join one or her of the public Services; all of these who so sired were ultimately reinstated, but during the ar years very few appointments were made. The lue of the fellowships, originally £250 per annum, as in 1919 increased to £300, and in 1920 to £400; 1922 they were classified as junior fellowships alue £350 per annum), fourth-year fellowships 400), and senior fellowships (£600). The main ject of this classification was to remove, as far as ssible, the objection that the fellowships opened up career to those possessed of the spirit of research d likely to become qualified for the highest positions teaching and research work. It was now possible r candidates to see seven years ahead—three as a nior fellow, one as a fourth-year fellow, and three a senior fellow. The income of the trust for the st financial year was about £11,500. In April, 1922, report on the after-careers of the first 50 Fellows owed that two had gained fellowships of the Royal ciety, four had become directors of research stitutes, eight were professors, eight university cturers, three were hospital physicians in charge of ecial and research departments, one was on a scientic research expedition. One only was engaged in edical practice. Four women Fellows had married, d most of the others were holding responsible pointments or pursuing independent research. Of e 29 Fellows since elected, 16 still hold fellowships. fter the report had been received, the trustees oceeded to the election of Fellows. The number of ndidates was 36, the largest since the first election. e following are the names of the elected candidates, ith an indication of the direction of research or oposed research:—Senior Fellowship: Dr. David eilin, life-history of parasitic protista and physiology parasitic metazoa. Fourth-year Fellowship: Miss atherine H. Coward, D.Sc., investigation into ocesses of metabolism, nutrition, and growth of ung animals, particularly with references to deficiency diseases. Junior Fellowships (ten were awarded stead of six as stated in the advertisements, on count of the high qualifications of candidates): r. J. M. H. Campbell (1) oxygen consumption and lmonary ventilation during and after work in chronic heart and lung disease, and total metabolism and "efficiency" of work in these and other diseased conditions; (2) changes in capillary circulation in the skin in dermographia, urticaria, angioneurotic œdema, and certain chronic nervous diseases. Dr. C. G. Lambie, influence of insulin upon fat and protein metabolism. Mr. W. K. Slater, M.Sc., (1) completion of work on a correction of the value for the heat of combustion of glycogen, (2) determination of the molecular weight of glycogen, (3) partial supervision in the initial chemical work in the extraction of insulin, (4) investigation of cell mechanism under anaerobic conditions. Dr. Dorothy S. Russell, the relation of renal efficiency tests to the morbid anatomy and histology of kidneys. Mr. C. P. Stewart, M.Sc., (1) investigation of methods of isolation and chemical constitution of thyroxin, (2) continuation of research on liver perfusion of substances related to histidine. Mr. H. J. Channon, B.Sc., study of certain fundamental dietary factors in the nutrition of living organisms. Mr. William Smith, B.A., and Mr. Lewis B. Winter, B.S., investigations on general metabolism in health and disease, with special reference to metabolism of carbohydrates and the cause of diabetes. Miss D. B. Steabben, B.Sc., investigation of mechanism of response to injection of colloidal substances. Mr. C. S. Hicks, M.Sc., (1) investigation of the causation of goitre from a biochemical standpoint, (2) chemistry and pharmacology of substituents in the thyroxin molecule.

BRONCHIAL ASTHMA DUE TO MICE.

Dr. William Lintz,[1] clinical professor of medicine in the Long Island College Hospital, remarks that while emanations from all sorts of animals have been known to cause attacks of bronchial asthma, there is no case on record in which emanations from rats or mice have been the cause of such an attack. The following case which recently came under his observation is therefore the first example of mice being the cause of bronchial asthma. The patient was a married woman, aged 36, who had been suffering for the last seven years from typical attacks of bronchial asthma which occurred four or five times a month, mostly at night, only occasionally in the day-time, and chiefly from December to March. The attacks did not appear to bear any relation to food, weather, or the emanations from the cat, horse, or dog. All laboratory examinations and cutaneous allergic tests proved negative. No cause could be detected for the attacks, which were relieved by injection of adrenalin, until Dr. Lintz in examining the patient's premises was struck by the number of mouse-traps scattered about the house and learnt that the place was infested by rats and mice. It then occurred to him that the asthmatic attacks might be due to mice for the following reasons: (1) The attacks occurred from December to March, when the mice had left the fields for food and warmth in the house. (2) They usually took place at night, when the mice were running about the house. (3) When the patient stayed at her mother's house, a short distance away, in which there were no rodents, she was free from the attacks, which recurred as soon as she returned home and lay down in her bedroom. The correctness of the hypothesis was confirmed by exposing the patient to the emanations of a mouse without her knowledge, so as to exclude all psychical influence by placing the animal in a covered box and asking her to smell it at a time when she was perfectly free from asthma. Three minutes later she had a typical asthmatic attack associated with intense dermatitis. A very energetic campaign against the rodents in the house was then undertaken, and after removal of a few dead rats from beneath the patient's bedroom floor she remained free for three years from all attacks. The case proves, as Dr. Lintz remarks, that cases of bronchial asthma are pieces of research work, and often require a knowledge of the patient's environment before the problem can be solved.

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[1] New York Medical Jour. and Medical Record, June 20th, 1923.

ON SMALL-POX DIAGNOSIS.

The recent spell of tropical weather, which lasted continuously for nearly a fortnight, has synchronised with some remarkable cases of chicken-pox, of such a nature that further notes may be helpful to those faced with similar cases should the hot weather recur. The striking feature of these cases of chicken-pox has been the profuseness of the rash upon certain sunburnt surfaces such as the forearm and neck; and also the extreme severity of the rash, so that the secondary fever has reached a temperature of 103° F. in one and 104° in another of the cases. It seems that it is the flushed, sweaty, and irritated condition of the skin which has led to some of these severe rashes. They form good illustrations of the value of attaching due weight to all the evidence. One of these cases may be quoted:—

H. B., male, aged 14, was covered from head to foot with a most copious rash, the total number of his spots amounting to probably at least 1500. An approximate count of his spots showed as follows: Right hand, palm 5 faint spots, back of hand 50 to 70, right forearm 100 to 150, right arm 150 to 200. Left hand, palm 3 faint spots, back of hand 40 to 60, left forearm 60 to 80, left arm 100 to 140. Face 200 to 300, front of chest and abdomen 400 to 500. In the left armpit were 20 to 30 spots and in the right armpit 15 to 25; on the sole of the right foot about 10 to 20 spots, left sole 8 to 12 spots. A temperature of 104° F. was reached during the suppuration of the pocks. It was noteworthy also that at the onset, but for the occurrence of the spots, neither the patient nor his mother would have noticed any illness in him at all. The lesions, notably on the trunk, were superficial with crenate outline, irregularly oval, the long axis running parallel to the natural folds of the skin; in fact many of them individually were precisely typical of chicken-pox, the only unusual feature being their extreme abundance. They had matured at a much more rapid rate than would have been possible in variola. The boy had been vaccinated in infancy and showed four plain scars. There had been chicken-pox among some vaccinated children in the house. Another striking case was that which occurred in two children who recently had been spending a holiday at the seaside and whose legs had been so scorched by the sun that there was mild acute sunburn. The rash of chicken-pox had picked out these children's irritated surfaces in a very remarkable degre here again the diagnosis was rendered perfectly clear by t concomitant signs. In yet another case the neck and upp part of the back had been remarkably picked out by the ras of chicken-pox, owing presumably to that area having be partly sun-scorched and partly chafed due to the cloth bearing on a perspiring surface.

While the rash of both small-pox and, to a les degree, of chicken-pox favours irritated surfaces, more intense degree of hyperæmia may be require in chicken-pox than in small-pox to bring out th peculiar phenomenon. The suggestion is wort following up should the heat continue.

By the courtesy of the Ministry of Health and wit the permission of the patient we reproduce herewit a photograph of Mrs. A. and baby taken at Gloucest on June 26th and showing the characteristic eruptio of small-pox with its well-marked centrifugal distribu tion on face and arms. Mrs. A., aged 26, was notifie as suffering from small-pox on June 15th and admitte to hospital on the same day. The onset of prodrom symptoms was on June 9th with headache, vomitin and pains all over; the rash appeared on June 12t profuse and coherent on face, arms, and legs, givin rise for four days to a secondary temperature 100°–101° F. Desquamation was practically con plete on July 16th. At the time of admission hospital Mrs. A. was nursing a baby who accompanie her. The baby was successfully vaccinated in fou places on the arm on June 16th and has remaine free from infection. Mrs. A. continued to nur the baby during her illness.

A Case of "Mild Small-pox" as at Present Prevalent in Gloucestershire.

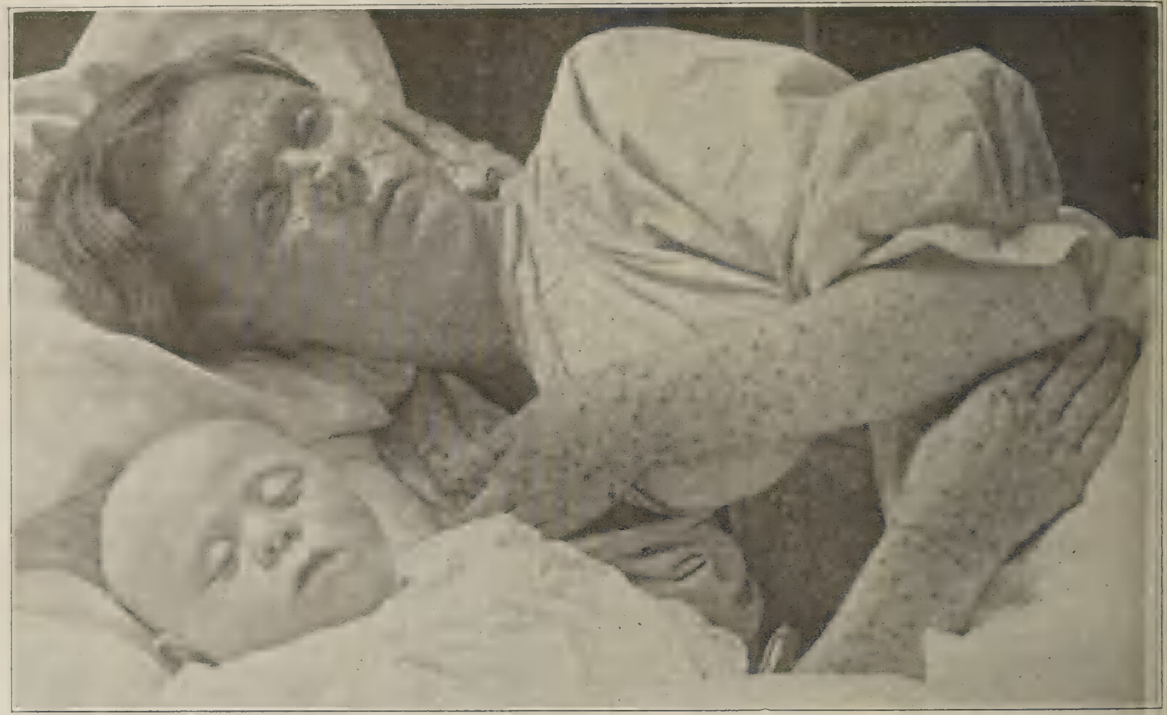

Photo by H. C. Leat, Gloucester.

HELP IN THE SEARCH FOR REFERENCES.

The time and physical energy wasted in the searc for references by anyone engaged in the pursuit scientific investigations disheartens on occasion t most zealous worker. If he neglects even on possible source of information, which may be speciall difficult of access, he may be punished by findin just before or even after publication that his researc es no more than repeat experiments and confirm sults already amply established, perhaps by workers Hong-Kong, Christiania, or some South American public, and printed in full in the native language the investigator. Most scientific libraries have liable indices whereby the titles of relevant papers ay be found, but the periodical itself may not among those taken in at the library, and the rarian may be at a loss to suggest where it may inspected. To fill this need Prof. R. T. Leiper, .R.S., some time ago suggested to the British edical Association the production of an index or ide to the libraries in which the very numerous ientific periodicals can be found, and he has now, ith the collaboration of Mrs. H. M. Williams and iss G. Z. L. Le Bas, M.Sc., prepared such an index. he list prepared by Prof. Leiper and his colleagues rves to indicate where much of the periodical erature of medicine and the allied sciences may be nsulted, not only in London, but also in Cambridge, Oxford, Edinburgh, Glasgow, Liverpool, and anchester, and has been compiled from library talogues and from lists made personally by the mpilers. It reveals the important fact that the ational Library in the British Museum contains lso the most extensive and representative series of reign medical and scientific periodicals in Britain. he book is being published this week at the price f 10*s.* 6*d.*, and will be obtainable through any ookseller, or at the offices of the British Medical ssociation, 429, Strand, London, W.C. 2.

THE RELIEF OF LEPROSY IN THE BRITISH EMPIRE.

ON July 12th, at a meeting held in the India Office nder the chairmanship of Lord Chelmsford, it was ecided to form a British Empire Leprosy Relief ssociation. Despite the imperfect statistics available in this connexion, the British Empire is acknowedged to contain more known lepers than any other olitical unit, but far less is done for these sufferers, n proportion to their numbers, within the Imperial oundaries than in the United States. Less than per cent. of British-governed lepers are now cared or in any way, and of that percentage only a small roportion are receiving the latest form of treatment —a fact mainly due to the poverty of India, tropical frica, and the West Indies, the countries most ffected. The present situation in India is briefly ndicated in another column in connexion with the vork of the Mission to Lepers.[1] An influential eneral committee, and a strong executive committee, vith subcommittees, were appointed to draw up lans for action by the association, whose establishnent and promised activity will be a source of great atisfaction to all who realise the extent of the leper roblem in the Empire, and the hope given by recent dvances in the treatment of the disease.

ANNUAL MEETING OF THE B.M.A.

THE annual meeting of the British Medical Association opens to-day, Friday, July 20th, at Portsmouth, when Sir William Macewen, the President, will vacate office in favour of the President-Elect, Mr. C. P. Childe, senior surgeon to the Royal Portsmouth Hospital. The time chart of the meeting follows precedent in that the opening and three following week days will be taken up by the annual Representative Meeting, while the Scientific Sections will meet on Wednesday, Thursday, and Friday, July 25th, 26th, and 27th. The annual dinner of the Association will take place at the City Town Hall on July 26th. The exhibition of surgical appliances, foods, drugs, and books will be open during next week, the closing day of which—viz., Saturday, July 28th—has been set apart for excursions to places of interest in the neighbourhood. The hon. local general secretary is Mr. C. A. Scott Ridout, of St. Emo, Clarendon-road, Southsea.

THE house and library of the Royal Society of Medicine will be closed for cleaning and repairs during the whole of August.

SIR Napier Burnett's fourth annual report on the Voluntary Hospitals in Great Britain (excluding London) has just been issued. In an introductory note Sir Arthur Stanley calls attention to the wonderful improvement in financial position shown by these hospitals in 1922, when the ordinary income of 666 hospitals only fell short of ordinary expenditure by £75,000. "Mass contribution" has been successfully called in to redress the balance of the old individual donor who has dropped out. The curious fact is revealed that out of a total of 5179 beds in "cottage hospitals" 2000 were vacant during 1922. Mention is made of increasing laboratory accommodation in hospitals throughout the country and of the establishment by the Red Cross Joint Council of a central bureau of information on hospital matters.

ROYAL MEDICAL BENEVOLENT FUND.

AT the meeting of the Committee on July 3rd 25 cases were considered and £262 voted to 17 applicants. The following is a summary of some of the cases relieved:—

Daughters, aged 51 and 46, of M.D. St. Andrews who practised in Hampshire and died in 1878. Through the death of a brother, whose pension ceased at his death, these ladies are in somewhat straitened circumstances, having had to find the money for the brother's funeral. After his estate is cleared up they do not expect their income to exceed £30 per annum each. The elder sister received £30 from sewing, and the younger £20 as a journalist. The rent amounts to £1 per week. Voted £20.

Daughter, aged 54, of M.R.C.S. Eng. who practised at Mold and died in 1871. Applicant was a school nurse, but since May, 1922, she had pneumonia, and has not been able to carry on her work and is now suffering from degeneration of the cerebellum. Her brother will allow her 5*s.* per week and friends have given her £5. She receives board and lodging in return for light household duties. Voted £18 in 12 instalments.

Widow, aged 63, of M.R.C.S. who practised in Cheltenham and died in 1920. Through rheumatic fever and congestion of the lungs applicant has only earned £40 during the last 12 months. Youngest son was studying medicine, but owing to death of father had to give it up and take a post in a bank. Applicant has had an offer to go to B.C. to look after some children, but has not the means to go. Voted £5.

Widow, aged 49, of M.R.C.S. Eng. who practised in Wales and died in 1910. A brother-in-law has aided the applicant to the extent of £15 per annum, but he has now retired and is unable to continue this assistance. This money was used to pay the eldest daughter's travelling expenses to and from school, and the applicant asks the Fund if they can make a grant for this purpose. Voted £10 in two instalments.

Subscriptions may be sent to the honorary treasurer, Sir Charters Symonds, K.B.E., at 11, Chandos-street, Cavendish-square, London, W. 1.

INDEX TO "THE LANCET," VOL. I., 1923.

THE Index and Title-page to Vol. I., 1923, which was completed with the issue of June 30th, will shortly be published. A copy will be sent gratis to subscribers on receipt of a post-card addressed to the Manager of THE LANCET, 1, Bedford-street, Strand, W.C. 2.

SMALL-POX IN ENGLAND AND WALES.—During the week ending July 7th 145 cases of small-pox were notified (the largest number this year) in England and Wales, the distribution being as follows: Derbyshire 15 (Alfreton 1, Long Eaton 13, Shardlow R.D. 1); Durham 1 (Stockton-on-Tees "doubtful"); Gloucestershire 93 (Gloucester 91, "including 18 cases of chicken-pox rediagnosed as small-pox," Gloucester R.D. 1, Stroud R.D. 1); Lancaster 1 (Colne); Nottinghamshire 22 (Kirkby-in-Ashfield 8, Sutton-in-Ashfield 14); Westmorland 1 (Windermere, "doubtful"); Wilts 1 (Swindon); Yorks West Riding 8 (Huddersfield 1, Bentley-with-Arksey 1, Doncaster 1, Doncaster R.D. 5); Flintshire 1 (Flint); Monmouth 2 (Rhymney 1, Risca 1).

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[1] See p. 153.

Modern Technique in Treatment.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

XXIX.—THE TREATMENT OF HABITUAL CONSTIPATION.

The general public usually believes that it is capable of diagnosing and treating habitual constipation for itself. Consequently a patient rarely comes for advice who is not already under treatment prescribed by himself or his friends. In many cases his symptoms are due to his pills rather than his constipation, and it is impossible to make an accurate diagnosis, upon which satisfactory treatment must depend, until he discontinues to use his remedies for a few days.

My investigations with the X rays between 1907 and 1909 led me to classify habitual constipation broadly into two forms: (1) colonic constipation, in which there is delay in the passage of fæces from the cæcum to the rectum, and (2) dyschezia, or inefficient defæcation, in which the patient has lost the power of expelling the contents of the rectum. In colonic constipation the cæcum and ascending colon, or less frequently some other part or the whole of the colon, is found on abdominal palpation to be distended with fæces, but digital examination shows that the rectum is empty. On the other hand, in dyschezia the rectum is full, although the patient is generally unaware of this and is quite incapable of emptying it; no accumulation of fæces is present in the rest of the bowel, except sometimes in the pelvic colon. An accurate diagnosis can only be made with the aid of the X rays, which show exactly what part of the colon is involved in colonic constipation, whilst in dyschezia they show that the passage as far as the rectum is normal in rate. In my experience the two forms of constipation are about equally common, many of the most severe cases being examples of dyschezia. Colonic constipation, if untreated, is much more likely to give rise to toxic and other symptoms than dyschezia, which generally leads to nothing more than inconvenience and slight local discomfort, unless it is treated by aperients and other unsuitable measures, which themselves give rise to toxæmia by irritating the colon and keeping it full of fluid fæces, which form an excellent medium for bacterial activity.

In general colonic constipation requires treatment by diet, and, in severer cases by drugs and massage, and dyschezia by persuasion and exercises, and, in severer cases, by graduated enemas. In both attention to the

Hygiene of the Bowels

is essential. Constipation can generally be prevented by proper attention to the hygiene of the bowels, and most mild cases, especially of dyschezia, can be cured in this way. The individual should have a cold bath on getting up, or at least a cold douche over the abdomen and back after a warm bath, and should not breakfast in bed. He should rise sufficiently early to allow plenty of time for his visit to the water-closet, which he should never fail to make after breakfast, even if he feels no desire to open his bowels. If the bowels do not act, he should try again after a walk or after lunch or dinner. The water-closet should be well ventilated, but not too cold. The seat should be low enough to allow a crouching position to be adopted; if necessary, a footstool should be provided; in severe dyschezia a bed-pan should be placed on the floor, over which the patient can squat. Too much attention should not be paid to the subject; the patient should realise that "his bowels were made for man, not man for his bowels." For many one action on alternate days is sufficient; occasionally even longer intervals are normal, and I have known very healthy people with unusually greedy colons, who were never well if their bowels opened more than once a week.

Diet.

All cases of habitual constipation are benefited taking a suitable diet, and in slight cases this shou make the use of drugs unnecessary. The guidi principle is to give plenty of fruit and green veg tables, which leave an adequate residue to act as mechanical stimulus to intestinal activity, and most cases also contain chemical stimulants peristalsis. It is a good plan to take ten or a doze stewed prunes as well as jam or marmalade f breakfast every morning, and fruit, either raw stewed, and green vegetables either cooked or salad, both at lunch and dinner. A diet of this kin is particularly necessary in cases of habitual co stipation caused by a greedy colon, in which th absorptive power of the bowels is developed to a abnormal extent. In such cases the addition of teaspoonful or more of powdered agar-agar to porridg potatoes, or stewed fruit at each meal is useful, as expands by the absorption of moisture, and, bein almost completely indigestible, adds bulk to th otherwise insufficient fæces.

Drugs.

For colonic constipation a drug is required whic stimulates the colon without unduly irritating it, an the dose employed should be one which produces single formed stool each morning. In my experienc senna is, as a rule, the most satisfactory, and it ha the great advantage that the patient can accuratel regulate the dose he takes from day to day. In case of moderate severity seven senna pods shoul be tried the first evening. The number can the be increased or diminished according to the resu obtained, and when the right dose is discovered th patient should make frequent attempts to reduce by one pod every other night. The pods should b soaked in cold water for three hours, and the infusio should be drunk either at dinner-time or on going t bed. Hot water extracts a griping element fro the pods, which is absent from the cold infusion. any griping still results, one minim of tincture belladonna should be added to the infusion for eac senna pod.

Liquid paraffin passes through the alimentary cana without undergoing any change. It is quite inert but as Neville Wood, who introduced it to th profession in 1899, first pointed out, it makes har fæces soft, and so causes their passage through th bowel and their final expulsion from the rectum to b comparatively easy. It is therefore valuable i dyschezia as well as in colonic constipation. It ca be used in addition to any other methods of treatment if, for example, half an ounce is taken after breakfas and after dinner, the dose of senna required in a cas of colonic constipation is much reduced.

Enemas.

In the majority of cases of habitual constipatio there is a tendency for an accumulation of fæces t occur. If abdominal or rectal examination ha shown that this is the case, the bowels should b thoroughly washed out before any other treatment i begun. In very severe cases of colonic constipatio a douche should be given daily for two or three weeks the quantity used being gradually reduced from a initial injection of a pint and a half. The efficacy o the treatment is greatly increased by having the colo massaged whilst the water is still present in it. Th fluid should be run in at a pressure no greater tha 18 inches, the quantity used should never excee a pint and a half, and the tube should not be inserte more than two inches from the anus. The X ray have proved that fluid introduced in this way alway reaches the cæcum unless organic obstruction i present, and that a tube introduced more tha 4 inches—as with the old-fashioned "high enema" o the so-called Plombières treatment—simply curl round and round in the rectum and irritates its mucou membrane, as it is almost impossible for it to pas round the pelvic-rectal flexure into the pelvic colon.

If re-education alone fails to cure a case of dyschezia graduated glycerine enemas should be tried. The tient makes an effort to open his bowels each morning er breakfast. If he fails, an ounce of glycerine is ected. Should this prove successful, the next rning one drachm of the ounce is replaced by ter, and on successive days the strength of glycerine steadily reduced till eventually an ounce of water h no glycerine is used. By this time the patient generally cured, but it is occasionally necessary to ntinue with the water in diminishing quantity for few more days. Sometimes glycerine does not act tisfactorily. Graduated water enemas should then substituted; if a pint is found to act well, the ount used should be reduced by one ounce every y till no more injections are required.

Massage and Exercises.

In severe cases of colonic constipation massage is of e greatest value. The first treatment should be ven after the patient has had an opaque meal; he s on the X ray couch under the fluorescent screen, that the masseur can be shown the exact position the colon, the part chiefly affected, and what anipulations are required to influence it. In schezia, and in some cases of colonic constipation, assage is very useful for improving the condition of e abdominal muscles. Swedish exercises are still ore valuable. In the numerous cases of dyschezia, hich are due to weakness of the muscles of the dominal wall and pelvic floor, daily exercises for me weeks produce excellent results. The muscles the pelvic floor should not be forgotten, as in women ho have borne children weakness of the levator ani uscle is a very common factor in the production of yschezia. The patient should be taught to draw in r anus, just as if she were trying to prevent a liquid ool from being evacuated; she then relaxes. This ercise should be repeated 30 times every morning d evening whilst lying in bed. Not only does it help cure the dyschezia, but it quickly overcomes minor grees of rectal and vaginal prolapse.

Regular exercise in the open air is very beneficial. ight constipation can often be cured by inducing man to walk a couple of miles on his way to usiness; though unable to open his bowels directly fter breakfast, he will have no difficulty on arriving his office. A man who is busy during the week ould take as much exercise as possible on Saturday fternoon and on Sunday, and he should have dequate annual holidays to prevent over-fatigue, oth mental and physical; this is an important factor many cases of habitual constipation.

Surgery.

There is no surgery of habitual constipation. leo-sigmoidostomy, and partial and complete colecomy are—or should be—dead. Grave organic isease leading to intestinal stasis is not included under habitual constipation"; it calls, of course, for peration. But in the absence of this, surgery is as uch out of place in disorders of the colon as it is functional disorders of the stomach.

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Physician to Guy's Hospital.

Previous articles in this series are:—

. Medical Treatment of Gall-Bladder Disease, by Sir Humphry Rolleston. II. Early Pulmonary Tuberculosis in the Young Adult, by Dr. Claude Lillingston. III. Neuralgias of the Head and Neck, by Dr. Wilfred Harris. IV. Whooping-Cough, by Dr. T. Izod Bennett. V. Scabies and Pediculosis, by Dr. H. W. Barber. VI. Abdominal Injuries, by Prof. Charles A. Morton. VII. Aural Discharge in Children, by Mr. Harold Barwell. VIII. Vaginal Discharge, by Mr. A. W. Bourne. IX. Minor Injuries to the Eye, by Sir J. H. Parsons. X. Epilepsy, by Dr. Gordon Holmes. XI. Inguinal Hernia in Childhood, by Mr. C. W. G. Bryan. XIV. Club-foot in the Newly-born, by Sir Robert Jones. XV. Intestinal Worms, by Dr. R. Hutchison. XVI. Primary or Spasmodic Dysmenorrhœa, by Dr. G. Blacker. XVII. Measles, by Dr. Foord Caiger. XVIII. and XIX. Heart Failure, Preventive Treatment, Therapeutics, by Dr. J. Parkinson. XX. Gonococcal Epididymitis and its Bearing on Sterility, by Mr. Kenneth M. Walker. XXI. Ante-partum Hæmorrhage, by Dr. T. Watts Eden. XXII. Ringworm, by Dr. A. Whitfield. XXIII. Cystitis, by Mr. J. B. Macalpine. XXIV. Hæmorrhoids, by Mr. R. M. Rowe. XXV. Puerperal Sepsis, by Lady Barrett. XXVI. Cyclic Vomiting, by Dr. G. F. Still. XXVII. Asthma, by Dr. E. P. Poulton. XXVIII. Traumatic Rupture of the Urethra, by Mr. G. Grey Turner.

Special Articles.

IMPERIAL CANCER RESEARCH FUND.

ANNUAL REPORT.

THE twenty-first annual report of the Imperial Cancer Research Fund, under the direction of the Royal College of Physicians of London and the Royal College of Surgeons of England, was submitted at the annual meeting of the Fund held on July 17th, the Duke of Bedford, President of the Fund, being in the chair.

Honorary Treasurer's Report.

Sir George Makins, honorary treasurer, in his report, stated in the past year subscriptions to the Fund had amounted to £951 11*s.* 6*d.*, being an increase of £447 1*s.* 0*d.* on the previous year, and several legacies of considerable amount had been received, totalling £3,675 15*s.* 6*d.* The amount of £4000 promised by Mr. and Mrs. Todman last year has been received, and in addition, through the munificence of an anonymous benefactor, the Alice Memorial Fellowship, amounting to about £500 per annum, had been endowed. It was earnestly to be hoped that supporters would continue to contribute to the Imperial Cancer Research Fund, as by so doing they would be supporting researches which have proceeded without cessation since the year 1902.

Secretary's Report.

It was announced that the lease of the farm hitherto occupied by the Fund expires in September, and that a portion of the land acquired by the Medical Research Council at Mill Hill has been leased from the Council for 21 years. It is hoped that the close association between the two staffs in the laboratories to be built at Mill Hill may be of considerable benefit to scientific investigation.

The conditions agreed on for the prize offered by Lord Atholstan for the discovery of a cure for cancer are set out, and include a provision that all applicants must in the first place satisfy a recognised medical faculty or a leading medical society in his or her own country (*a*) that there is some scientific basis to justify experimental investigation of the professed cure, (*b*) that any cases said to be successfully treated were, in fact, cases of cancer, and one that applicants must disclose to the medical faculty or medical society investigating the professed cure its nature and ingredients, and the method of its preparation. Lord Atholstan's grant to the Fund for research has been utilised by the appointment of Dr. A. M. Begg to carry out an investigation on the subject of the infective sarcomata (dogs and fowls) with a view to defining the difference, if any, between them and true neoplasms. In March last the liberal offer of an anonymous donor to found an "Alice Memorial Fellowship" for cancer research under the auspices of the Imperial Cancer Research Fund was accepted, and Dr. Marshall Findlay has been appointed the first "Alice Memorial Fellow." The list of scientific papers published by members of the staff during the year is an imposing one. Material from the laboratory has been sent to 13 workers at home and abroad. A considerable portion of the annual report is devoted to an account of the negotiations between the executive committee of the Fund and the committee of the British Empire Cancer Campaign. When the Fund was first approached early in April of this year by the promoters of the Campaign with a view to its coöperation, a resolution was passed that before the Imperial Cancer Research Fund agrees to coöperate with the British Empire Cancer Crusade in organising and carrying out cancer research, it must be satisfied as to the conditions to be adopted in allocating the money to be raised by the appeal. At another meeting on April 18th, as the result of further correspondence, it was agreed that the Fund did not see its way to associate itself with the cancer crusade unless other cancer research institutions were invited to take part and to receive similar financial support. The Fund suggested that the following institutions should be invited to occupy a similar position in relation to the crusade—namely, the Cancer Hospital, the Middlesex Hospital, the Radium Institute, the Manchester Cancer Investigation, the Liverpool University Cancer Committee, the Glasgow Cancer Hospital, and the Marischal College, Aberdeen, the attitude of the Fund depending on that of the majority of these institutions. The Fund deprecated any appeal to the public based on the supposition that if large sums of money are provided a cure will be found at an early date. The committee of the British Empire Cancer Campaign did not at first (May 2nd) see their way to invite the bodies mentioned to appoint representatives, and consequently it was considered inadvisable by the executive committee that the Fund should participate in the Campaign.

Subsequently, as the result of further correspondence, numerous interviews, and an intimation that most of the institutions interested in cancer research above referred to had been invited and that some had agreed to join in the campaign, the executive committee on May 16th decided to appoint five representatives to the grand council of the Campaign. Since this time further difficulties have arisen, certain clauses in the Articles of Association of the Campaign, which had not previously been disclosed to the executive committee of the Fund, not meeting with their approval; but in view of the proposed modifications in the Articles of Association, including the formation of a scientific committee which shall advise on the allocation of funds for scientific research, it is believed that the Imperial Cancer Research Fund will be able to coöperate in the Campaign.

Speech of Chairman of Executive Committee.

The report of the Director, Dr. J. A. Murray, was well summarised by Sir William Church, chairman of the executive committee, in moving the adoption of the report. He said:—

Vitamin Deficiencies.—The laborious study of vitamin B and vitamin A deficiencies in which Dr. W. Cramer has been engaged for the last three years may now be considered as completed. Neither of these deficiencies, nor both combined, arrested the growth of cancer, even when pushed to a degree incompatible with life. The great adaptability of the cancer cell to changes in its environment frustrated the hopes which were aroused by the discovery of the profound influence of these food accessories on the growth of young animals. In the course of these researches a striking similarity was found between the effects of vitamin deficiencies and the damage produced by radium and X rays. The study of this relation was made possible by the close and friendly collaboration of Dr. Mottram of the Radium Institute.

Tissue Culture.—The improvement Dr. Drew has made in the methods of tissue culture outside the body have enabled him to add considerably to our knowledge of the factors which control the differentiation of tissues, and also of the mechanism of repair after injury. Using the growth of normal tissues in vitro as an indicator of the presence of active substances in the culture medium, he has proved that differentiation of epithelial cells is mainly controlled by the interaction of the connective tissues with them. When connective tissue cells are absent, the characteristic form and arrangement of the epithelial cells do not appear. The addition of connective tissue cells to an undifferentiated sheet of epithelial cells is quickly followed by typical differentiation. The process can be reversed, and repeated at will. The same holds good for cultures of transplantable new growths. Extremely undifferentiated mammary carcinoma can be turned in vitro into an adenomatous structure very similar to developing mamma. These results are a further step in the elimination of unimportant details from the cancer problem. Loss of differentiation when it occurs in cancer, is not a fundamental permanent feature as has long been supposed. It is superficial and may disappear without corresponding change in malignancy.

Repair of Injury.—The way in which injury sets repair agoing has been studied and throws an interesting sidelight on the growth of cancer. While embryonic tissues and tumours start growing at once when placed in a suitable culture medium, tissues from adults, even if young, only start growing after an initial delay which may be as long as 14 days. If adult kidney be ground up with saline solution and incubated for two hours and then filtered, the addition of the filtrate to the culture medium starts adult tissue growin at once. An extract of unincubated damaged kidney ha no such power. An extract of undamaged rapidly growin carcinoma or sarcoma, however, is as active as the extrac of incubated kidney. The cancer cells produce in th ordinary course of their existence substances which norma tissues elaborate only in response to injury.

Scientific Report.—A scientific report will be published i the autumn giving an account of these researches of D Cramer and of Dr. Drew, as well as further observations b Dr. Murray on the difficulty met with when the attempt made to produce a new carcinoma by tar painting in anima in which primary cancer has already appeared. The extensio of Dr. Russell's work on carbohydrate metabolism of norma and cancerous tissues to the pentoses, and other papers, wi also appear in it.

Statement of Progress Achieved.—As this is the last occasio on which I shall move the adoption of the annua report, I hope I may be permitted to occupy your attentio a little longer with a brief statement of the progress achieve in the 21 years I have been chairman of the executiv committee. When the Fund started cancer was generall believed to be a disease of civilised man. A parasitic causation was very widely believed in and those who regarded suc a causation as unlikely in carcinoma were ready to admit it probability for sarcoma. We know now that cancer occu in all races of mankind and in all vertebrate animals. Th sarcomata have finally taken their place alongside th carcinomata as malignant new growths of connective tissu Their frequency increases as age advances in the same wa as the former, and sarcoma or carcinoma can be produce at will in laboratory animals according as the specifi irritant is applied to connective tissue or to epithelium.

The rôle of chronic irritation in starting cancer ha received experimental proof. Incidentally a rational explanation of the characteristic age incidence of cancer has bee provided at the same time. The influence of heredity can b relegated with considerable certainty to the transmission an enhanced sensitiveness to specific forms of irritatio The transplantability of new growths to healthy animals ha made a careful study of their essential features possibl The phenomena of resistance to transplantation and tissu immunity with their curious limitations have been studie in detail. The explanation of the failure of these methods t furnish a means of treatment for cancer has made mor precise our conception of the meaning of individuality in th higher animals. In all these investigations the Imperia Cancer Research Fund has played its part, in many of them a leading part. The present annual report shows that th working organisation is still vigorous and competent, an in laying down the duties of chairman of the executive committee I wish the Fund a successful future with confidence.

President's Speech.

The President said he was in complete agreement with the attitude taken by the executive committee with reference to coöperation with the British Empire Cancer Campaign.

The President understood that a subcommittee appointed by the grand council of the Campaign had decided to make certain recommendations for embodiment in the Articles of Association, including the appointment of an advisory committee to include members nominated by the Royal Society and by the Medical Research Council in joint consultation. In the event of these modifications being carried out they would secure the confidence and coöperation of bodies engaged in cancer research, including the Imperia Cancer Research Fund, because in their opinion the future administration of the Campaign would then be guided by those whose knowledge would enable the best use to be made of all funds available. It was obvious from letters and articles which appeared from time to time in the press that incredibly little was known of the work that had already been done by this Fund and by other research bodies in this country and abroad—for instance, the information regarding cancer collected by the Imperial Cancer Research Fund relating to the disease in native races throughout the empire and of its occurrence in all species of the animal kingdom. For this reason it would seem to be essential that the administration of the Funds of the Campaign should be in the hands of those who know what experimental work has already been done, and what information on the subject has already been accumulated. By these means useless repetition would be avoided and public money used to the best advantage.

The report showed that the Fund continued to rsue its considered policy of coöperation with the rkers in different laboratories coupled with the erchange of material; such coöperation and rdination must, however, be voluntary and could t be forced on the workers.

he President then proposed, and Dr. Sidney rtin, F.R.S., seconded, the adoption of the report. William Church was elected a Vice-President on resignation of the chairmanship of the executive mmittee.

ROVIDENT ASSOCIATION FOR HOSPITAL AND ADDITIONAL MEDICAL SERVICES.

EPORT FOR PERIOD NOV. 1ST, 1921–FEB 28TH, 1923.

THE National Provident Association for Hospital d Additional Medical Services, by arrangement with e several interests concerned, was established in ondon on Nov. 1st, 1921, and £55 was spent in a w newspaper advertisements. When 2315 members ere rapidly enrolled it was decided to treat the st year's working as an experiment and not seek rther members until the Association was incorporated and put on a permanent basis. The amount ceived in subscriptions was £1770.

Objects of the Scheme.

The object of the Association was to induce people, hile in health, to make provision for the time of rious illness and to enable its members to obtain ch services other than ordinary—i.e., general actitioner—treatment as they might require in ness without additional charge, and the services ovided included inter alia: the ordinary services a coöperating hospital, consultations at home in rious illness, the services of visiting nurses, treatment the Radium Institute when required, and the use ambulances.

It was decided: (1) That the scheme should be ovident—i.e., that the subscriptions should be of ch amount as would in the aggregate meet the cost the services required without encroachment upon aritable funds. (2) That the administration should in the hands of a neutral body which should partially guard the interests of all concerned.) That the work of the general practitioner should ot be interfered with, but that, as far as possible, e should be helped in his work for the benefit of ose of his patients who were members of the ssociation. (4) That all benefits under the scheme ould be obtained on the recommendation of the rivate medical attendant of the member. (5) That ere should be no interference with the existing les or routine and work of the hospitals or of any ther bodies concerned. (6) That the income limit rescribed for members should, as nearly as possible, e in accordance with the income limits of those dinarily admitted to hospital treatment.

An Experimental Year.

Arrangements had also been made for group embership on the same principles at a lower rate of bscription which would cover the hospital services ly, but this branch was transferred to the Hospital aving Association, who also took over and carried rough the incorporation which had been applied r to the Board of Trade. The income of £1770 for e period was allocated beforehand as follows, viz.:

			£	*s.*	*d.*
To nursing	3/40ths	....	132	15	0
To ambulances	1/40th	....	44	5	0
To consultations and radium	6/40ths	....	265	10	0
To coöperating hospitals ..	26/40ths	....	1150	10	0
To administration	3/80ths	....	66	7	6
To reserve	5/80ths	....	110	12	6

Of the 2315 members 56, or 2·4 per cent., were -patients during the year and their average stay in ospital was 23·8 days, while 258, or 11 per cent., were reated as out-patients or received special services, such as X ray, massage, electrical treatment, laboratory investigations, &c., the returns showing a total of 1378 attendances, or an average of 5·4 per patient. The payments to coöperating hospitals amounting to £1150 10*s.* are equivalent to a payment of £5 7*s.* 1*d.* a week for each in-patient and of 10*s.* for each out-patient, and include any provision which the hospitals may have made for a payment to general medical staff funds. Consultations in the patients' own homes were paid for by a fee of 3 guineas for each consultation. The amount allocated to nursing has been paid in full, but after paying for all the services rendered during the period, a balance of £406 remains in hand upon the other accounts, after all liabilities to members have been finally discharged.

Change of Name and Incorporation.

The committee feel that the year's experiment has fully justified their anticipations, and the statistical results encourage them to hope that in a system of provident coöperation lies the solution to the financial problem of the voluntary hospitals.

The report is signed by Sir Arthur Stanley, Lord Dawson of Penn, Mr. W. McAdam Eccles, Sir Alan G. Anderson, and Dr. J. F. Gordon Dill (hon. secretary), members of the Executive Committee.

On May 9th, 1923, the Association was registered under the Companies Acts, as a company not for profit, under the title of the British Provident Association for Hospital and Additional Services, the signatories to the memorandum and articles of association in addition to those named above being Lord Knutsford and Captain J. M. Gordon Dill.

RESEARCH IN TROPICAL DISEASE.

IV. THE WELLCOME BUREAU OF SCIENTIFIC RESEARCH.

THIS Bureau was founded towards the end of 1913 by Mr. Henry S. Wellcome, who, in 1902, had presented the laboratories bearing his name to the Sudan Government, and who has, in many directions, evinced his keen interest in tropical research. For the first few years of its existence the Bureau was housed at 10, Henrietta-street, Cavendish-square, but, subsequent to the war, removed to the premises it now occupies at 26, Endsleigh Gardens alongside the London School of Tropical Medicine, with which it has the privilege of coöperating in certain directions. From the start it has been under the direction of Dr. Andrew Balfour, formerly in the Education Department of the Sudan Government, director of the Wellcome Tropical Research Laboratories, Gordon Memorial College, Khartoum, and medical officer of health for that city.

The Bureau exists not only for purposes of research, more especially in connexion with tropical medicine and hygiene, but also with a view to supplying information gratis to medical men, sanitary administrators, and others interested in these subjects. From small beginnings it rapidly progressed, and though for a time its routine activities were curtailed by the war, the whole of its scientific staff being employed on military duties in one capacity or another, and for the most part abroad, work was resumed thereafter and has developed in various directions. There is now a deputy director, Lieut.-Colonel G. E. F. Stammers, R.A.M.C. (retd.), and departments of protozoology, pathology, bacteriology, helminthology, and entomology have been formed. In connexion with the last named, Mr. Wellcome has established a field laboratory at Wisley, Surrey, where work is carried out on mosquitoes and other insects of medical interest. An important feature of the Bureau is the large teaching and research museum of tropical medicine and hygiene arranged on graphic and somewhat novel lines, of which Dr. S. H. Daukes is the curator. This museum is freely open to all who may care to visit it, and arrangements are made whereby lecturers may bring their students and impart instruction to them in the museum itself. Evidence that these facilities are appreciated is given by the number of visitors and classes, the latter including many missionaries under training for the tropics.

Affiliated to the Bureau are the Wellcome Chemical Research Laboratories, which conduct researches in various departments of organic and inorganic chemistry and are specially concerned with plant analysis. Under Dr. T. A. Henry, late of the Imperial Institute, they collaborate with the Bureau in the investigation of native drugs, poisonous plants, spear, arrow, and fish poisons, and other matters intimately bound up with research in tropical medicine. The Bureau is also recognised by the Medical Research Council as an institution where its research workers may carry on investigations, and at the present moment two of its staff are engaged upon inquiries, dealing respectively with trypanosomiasis in British sheep and rat-bite fever.

Since its inception the Bureau has published over 100 papers dealing with many fields of tropical research, and has issued two volumes, one on tropical hygiene, the other on protozoology. As examples of the kind of work which has been undertaken, there may be cited the papers by Dr. C. M. Wenyon on malaria, intestinal protozoa, hæmatozoa, and Weil's disease; those by Dr. A. C. Stevenson on sleeping sickness, *Leptospira icterohæmorrhagiæ* in rats and the histopathology of typhus fever; those by Major H. C. Brown, I.M.S. (retd.), on remedies for dysentery; those by Dr. W. N. F. Woodland on porocephaliasis and on certain worms found in Nile fish; those by Mr. M. E. MacGregor on mosquitoes in England, and on myiasis; and those by Mr. G. C. Dudgeon on tropical fruit foods and certain parasites of rats. Joint work carried out with the staff of the chemical laboratories is evidenced by papers on the toxicity of emetine and on the reaction of the medium as affecting the toxicity of certain alkaloids towards protozoa, the latter being based on the combined researches of Dr. Henry and Major Brown. Apart from the war services rendered by the staff in several tropical and sub-tropical war areas, the Director-in-Chief carried out investigations in the West Indies and Central and South America prior to July, 1914, while of late years his services and those of Mr. MacGregor have been utilised by the Colonial Office in connexion with the sanitary regeneration of Mauritius.

In addition to research work in London the Bureau hopes to institute inquiries in the tropics and to link up the work at home with that abroad, where, it may be noted, museums modelled on that attached to the Bureau have been established in certain places, as, for example, Calcutta, Zanzibar, and Dar-es-Salaam.

BERLIN.

(FROM OUR OWN CORRESPONDENT.)

The Title of "Specialist."

THE title of specialist has not hitherto been officially recognised; its assumption has been left to the discretion of a medical man and to the disciplinary power of his medical society, and the Government has declined to introduce a special examination or an official qualification in this connexion. The title has been abused—some medical men, after perhaps no more than a six weeks' post-graduate course, and sometimes without even that training, have placed it on their doorplates, thereby attracting patients to the detriment of their colleagues. The German Medical Association will deal with the matter at its next meeting; reports will be presented by a general practitioner and by a specialist. The reporters, Dr. Küstermann, of Munich, and Dr. Stuelp, of Mülheim, have published in the *Aerztevereins-Blatt*, the official journal of the Association, the proposals to be made to the meeting. They state that scientific and technical training superior to that of the average medical man is necessary for a specialist. Only the following branches of medical science are to be recognised as specialities: (1) surgery, (2) gynæcolo and obstetrics, (3) orthopædics, (4) diseases of eyes, (5) diseases of the ear, nose and throat, diseases of the skin, venereal diseases, and disea of the urogenital organs, (7) nervous and br diseases, (8) radiography and heliotherapy, diseases of the mouth and jaws, (10) diseases of stomach and intestines and of metabolism, (11) inter diseases, (12) lung diseases, (13) diseases of childr The report states that it should be considered unp fessional to assume the title of specialist for m than one of those branches, except those clos connected—for example, surgery and orthopædics but even this exception should be valid only for th already in practice; new specialists should cho one branch only. It should also be unprofessional assume the double title of specialist and gene practitioner, as is done in some parts of Germa Specialist training should last for at least three yea and in relation to surgery, gynæcology, and inter medicine for four years. The intending speciali must have acted as an assistant in a universi clinic, in a special department of a large hospit in an out-patient department, and also as a priva assistant to a specialist of good standing, the latt for a time not exceeding one-third of the enti training. A specialist desiring to practise should gi notice to the local medical organisation, which w inquire as to whether he has fulfilled the conditio Inquiry should be entrusted to a board consisting specialists and general practitioners in equal numb If the board declines to recognise the specialist, t latter should have the right of appeal to the provinci medical chamber.[1] When, notwithstanding a defi tive rejection of his claim, he insists on calling hims a specialist, he should be liable to prosecution befo the court of honour of the chamber.[1] When trea ment by a specialist is no longer necessary, the latt should send the patient back to a general practitione and should abstain from general practice himsel The report rejects the idea of legislative interventi in this important question, which, it states, should left to medical discretion and settled by commo agreement of specialists and general practitione assembled in the next general meeting of the Medic Association.

Meeting of Socialist Doctors.

At a recent meeting of German and Austria Socialist medical men in Berlin the chairman, D Zadek, formerly a Berlin city councillor, pointe out that the number of socialists was smaller amon the medical profession than in any other, as the sick clubs, of which the great majority are under Sociali control, are somewhat hostile to the medical professio medical socialists, however, were by their positio fitted to settle disputes between these parties. Report were read on the sick-club question in Germany an Austria; Dr. Epstein, of Munich, said that once th medical man became a State official, as required i the programme of the Socialist party, the struggl between individual medical men and the struggle o the profession against the clubs would cease. Prof Grotjahn, a member of the Prussian Parliament proposed that the clubs should appoint medica men for group work in rooms placed at thei disposal on sick-club premises, and in hospitals, out patient departments, and first-aid stations. Patient unwilling to consult the appointed medical me might apply to their club for higher sick-pay, an might then consult a private medical attendant Dr. Weyl, a Berlin city councillor, advocated th appointment of a limited number of medical men he believed that in Berlin 1500 medical men woul suffice to secure an adequate attendance to clu members, instead of the 3000 and more at presen engaged in this work. He did not, however, say wha would become of medical men excluded in this way. Dr. Kautsky, of Vienna, wished that medical officer elected by the clubs should again stand for election after two years, appointment for life being made ependent upon re-election. This might mean that efore definitive appointment candidates would rescribe medicines lavishly and give certificates for ck-pay free in order to obtain votes. It was enerally agreed that the nationalisation of the erman medical profession as required by the programme of the Socialist party was impossible under the resent financial conditions.

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[1] See THE LANCET, 1923, i., 156.

Control of New Drugs.

The German Association for Internal Medicine, ogether with the Association of Sick Clubs, have made rrangements for examination of new drugs produced y chemical manufacturers. A commission has been et up under the chairmanship of Prof. Klemperer to xamine the efficacy and cost of new drugs; the ommission may base their opinion on pharmaceutical nd clinical testimonials produced by the manufacturer rovided the certificates shown derive from trustorthy sources. Otherwise the remedy will be sent or pharmacological examination to a university or ospital. The drugs recommended by the commission fter examination will be registered and the register ublished regularly, special mention being made of rugs suitably priced for use in sick-club practice. he clubs have provided the commission with dequate funds, hoping in this way to exclude certain ew drugs which do not differ much from older emedies except by their sounding names and higher rices.

Conditions in the Rhenish Spas.

Since the beginning of the Allied occupation the Rhenish spas and health resorts have been in great istress. The majority of German patients decline o go there for sentimental reasons and also because he cost of living is several times more expensive in ccupied districts than in the rest of Germany. Medical nen practising at the Rhenish spas have appealed to heir professional brethren in unoccupied Germany to end more patients; they assert that as the severe neasures put into force by the occupying forces affect nhabitants only, the outside patient has nothing to ear and may take his cure as he desires. Many of the pas are of international renown, such as Wiesbaden, Ems, Kreuznach and Neuenahr; Homburg, so well nown to English visitors, is not occupied but is eriously affected, being situated only a few hundred ards from the border of the occupied district. These spas were always chiefly, and are now nearly exclusively, frequented by foreigners, but Wiesbaden has now only a third of its pre-war numbers of patients, and Ems only a quarter. The great bathing establishments and kursaals of those spas are thus nearly empty. The loss to a city like Wiesbaden is estimated at milliards, and the municipal authorities have requested the German Government to allow the reopening of the gaming establishment closed by law n 1872. The appeal of the Rhenish medical men to heir colleagues outside the Rhineland was, of course, nade before the total blockade of the Ruhr and Rhine listricts against Germans; but visitors belonging to he Allied nations may go there without special permission, and English visitors will certainly be as velcome as formerly.

Aberdeen Joint Hospitals Site.—The Aberdeen town council has offered to dispose of the Burnside and Forresterhill estates to the parties of the proposed joint hospital accommodation scheme at a price of £35,000, the respective proportions of the price and ground being allocated as follows: Corporation (Public Health Dept.), 41 acres, at a cost of £13,335; Royal Infirmary, 36 acres, at a cost of £11,110; Sick Children's Hospital, 17¾ acres, at a cost of £5555; University, 16¼ acres, at a cost of £5000.

Bury Infirmary Extension.—Lord Derby, at Bury, on July 14th, laid the foundation-stone of a war memorial, which will be an addition to the Bury Infirmary, and will be used as a children's hospital. The estimated cost, including endowment, is £42,500, of which £40,000 have already been subscribed. On the morning of the opening ceremony an anonymous donor sent bank notes for £1000.

Obituary.

DONALD MURRAY, M.B., C.M. GLASG., D.P.H.

Dr. Donald Murray, sometime Member of Parliament for the Western Isles, died in a London nursing home on July 6th at the age of 60. He was born at Stornoway, in the Isle of Lewis, on Oct. 21st, 1862, and received his medical education at the Universities of Glasgow and Aberdeen, graduating M.B., C.M. from the former in 1890. Taking up general practice first at Brora, in Sutherland, and then in his native burgh, he afterwards, in 1910, obtained the diploma in public health at the University of Aberdeen, and became medical officer of health for Stornoway and the Lewis district, as well as school medical officer for Lewis and the western portion of Ross-shire. He was soon elected to the chairmanship of the school board and a justice of the peace for Ross and Cromarty. Always a keen debater, he presided over the Glasgow Medico-Chirurgical Society when still almost a student, and he became president of the Glasgow University Liberal Club. In 1918 he was returned as Independent Liberal member of Parliament for the Western Isles Division of Inverness and Ross and Cromarty, but was defeated at the last general election by the National Liberal candidate.

Captain Walter Elliot writes: "As secretary of the Medical Committee of the House of Commons I saw a very great deal of Donald Murray during the four years 1918–22, and we soon became fast friends. I think it was impossible for anyone to know Murray without conceiving for him the warmest friendship and admiration. His sincerity, his devotion to the interests of the community which he represented, his gaiety, and, above all, his tremendous humanity, were qualities rarely combined in one man. In political matters he gained the respect of his opponents both by his knowledge and his really extraordinary power of hard work, and as a man it was, I think, the verdict of the House as a whole that he was the only medical member of the House of Commons of any party whom any of us, myself included, would really have wished to see at his bedside in time of sickness. This is perhaps the ultimate test of a man, certainly of a physician, and judged by it the name of Donald Murray stands high indeed."

ETTIE SAYER, M.B., B.S. LOND.,

CONSULTING PHYSICIAN TO THE SOCIETY FOR THE WELFARE OF THE FEEBLEMINDED.

Miss Ettie Sayer died on July 7th after a long illness at the age of 48. She was the daughter of William Sayer, of Bacton, Norfolk, and received her early education at Rossell School, Paignton, Devon, afterwards entering University College and the London School of Medicine for Women, where she was Chesterfield medallist. Graduating M.B., B.S. Lond. in 1889, she became house surgeon to the Tunbridge Wells Eye and Ear Hospital and then registrar to the St. John's Hospital for Skin Diseases, before accepting the appointment of physician to the Cowley Mission to Mahommedan and Kaffir women. In 1901 Miss Sayer was made plague medical officer to the Cape Government, and in this capacity she visited the concentration camps during the Boer war and later the lepers in Robben Island. After her return to England Miss Sayer was assistant medical officer (1902–07) to the Education Department of the London County Council and acted as lecturer on first-aid to that body and to the Church Army nurses. Her interests were many-sided: a Fellow of the Royal Society of Medicine and of the American Electro-Therapeutical Society, she was also a member of the council of the Psycho-Medical Society and of the Eugenics Society, and was the author of articles on the effects of electric currents on blood pressure, on the causes and treatment of inebriety, the deterioration of vision during school life, and on morally defective children, and she wrote a text-book for nurses on medical electricity and light. She was well known as an uncompromising supporter of women's suffrage and of other movements for the benefit of women and children. Miss Sayer's death will be mourned by a wide circle who recognised her pertinacity of aim and honesty of purpose.

Public Health Services.

WILLESDEN MUNICIPAL HEALTH SERVICE.

THE dispute[1] between the Willesden Urban District Council and the Willesden Branch of the British Medical Association has come to an end, the approval of the Ministry of Health having been received for the Council's maternity and child welfare scheme, by which children under school age requiring treatment will be dealt with in the same way as school-children. The scheme is as follows:—

Medical Examination and Advice.—Expectant mothers, nursing mothers, and children under five years may attend the municipal clinics for medical examination and advice, except mothers and children known to be under the care of a private medical practitioner. Mothers known to be under such care may, however, attend lectures or other educational meetings at the clinics.

Clinic Treatment.—(1) Expectant and nursing mothers and children under five years found to be suffering from nits or vermin may be treated at the clinics. Expectant and nursing mothers found to be suffering from minor ailments to the limited extent indicated in Memoranda M. and C.W. 14 and M. and C.W. 4 may be treated at the clinics strictly in accord with the provisions of these memoranda. (2) Expectant and nursing mothers found to be suffering from definite disease or deformity, or conditions other than minor ailments, shall be referred to a private medical practitioner. Children under five years found on examination to be suffering from defects requiring attention, other than nits or vermin, shall be referred to a private medical practitioner. (3) Children under five years found to be suffering from minor ailments, defective eyesight, enlarged tonsils and adenoids, or ringworm (for X rays), and in respect of whom a postcard has not been received from a private medical practitioner intimating that he has undertaken the treatment of the case, and who for good and necessitous cause shown cannot obtain treatment from a private medical practitioner or general hospital, may be treated at the clinics.

Home Confinements.—In cases where the economic circumstances of the family do not exceed the minimum scale figures, midwives, maternity nurses, and home helps are provided for confinements at home, and home helps are provided in connexion with hospital confinements or illness in the expectant mother.

The scheme is practically what the Willesden Division of the B.M.A. have asked for, and is now under the supervision of the chairman of the Public Health Committee and Hospital Subcommittee (Dr. G. W. R. Skene) and the chairman of the Children's Care Committee (Dr. W. Lock), both of whom are also members of the Divisional Executive Committee. These two medical men are largely responsible for the carrying through of the scheme in face of considerable difficulty.

MENTAL HOSPITALS SERVICE.

FOUR COUNTY AND BOROUGH HOSPITALS.

THE annual reports of four county and borough mental hospitals[2] recently published have many features in common, and deal with several matters of medical and public interest. It is, perhaps, not out of place to comment on the very brief and formal style which characterises them. It is frequently difficult to gain from them any clear picture of the work which it is their purpose to record. This must always appear as a missed opportunity of enlightening the public, and a few paragraphs which do no more than retail the main statistics in anoth form, and record minor structural changes and form acknowledgments, can hardly be said to do justi to the vast amount of patient and careful wo performed by the staff of such institutions.

Much of the important information in these publ cations is to be found in the reports of the Commi sioners, who may express gratification at notabl successful features of the hospital, or indicate directio in which some change is desirable. In three of the reports (the exception being West Humberston such recommendations are comparatively numerou and are of a similar nature in each. The patient diet (which usually costs about 5*s*. per head per wee is accused of monotony: a breakfast of bread an margarine and tea is the meal to which this comme is chiefly directed. In one case the women receive this diet, whereas the men were given porridge an milk. The clothing, particularly of the wome requires improvement; it is pointed out that patients had more reason to take some pride in the appearance, the effect, both on the clothing itse and on the wearers' well-being, would be far fro negligible. In one case it appeared necessary tha more tooth-brushes should be provided, and that ca should be taken to mark and preserve them fo individual patients. Another matter upon whic comment is made is the degree of patients' freedo The doors into the airing-grounds should be left ope for longer daily periods; windows so constructe that to open them widely is impossible give a unnecessary sense of confinement; more patient should be allowed liberty in the grounds and outsid them; more should be allowed out on trial, an such patients should receive a money allowanc to enable them, if possible, to make a new start i life. Other suggestions are that letter-boxes shoul be provided in each ward, the key being kept by medical officer, and that more cards and other game should be available. In two of the hospitals n dentist attended regularly. At Worcester, the pos of third assistant medical officer has been vacant fo some months, and a Commissioner expresses surpris that no married quarters are available for any medica officer other than the superintendent. The committe are considering the desirability of providing suc married quarters, of improving the water-supply (t which two deaths from paratyphoid are attributed) and of reconstructing part of the male side to permi of proper accommodation for recent and recoverabl cases. At West Humberstone a dentist has bee appointed and an X ray plant installed. An additional medical officer is to be appointed whose tim will be devoted chiefly to pathological work Further innovations are the keeping of case-sheets i the wards themselves, and the provision of room where interviews or psychotherapy can be undertake in private.

These improvements and defects are worthy o comment, in that many of them are engaging th attention of mental hospital committees throughou the country. It is foolish to deny that such defect are common to a large proportion of county an borough mental hospitals, and on the other hand, it i worthy of record that some are being remedied. Th difficulty which in every case stands in the way o improvement is money. Organisation and treatmen are as nearly perfect as the resources of the institution permit, but the amenities which characterise life i a hospital for private patients, and play no small part i promoting recovery, can only be provided if the loca authorities consent to an increase in expenditure. O these lay bodies rests the responsibility of "asylum reform."

SCHOOL MEDICAL SERVICE.

Dewsbury.

THE school medical officer makes some interesting observations in connexion with the nutritional condition of the school population in Dewsbury for 1922 as compared with 1921. In 1921 the percentage children with so-called malnutrition was practically e same for all ages. In 1922 a progressive deterioran is shown as both boys and girls advance in years.

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[1] THE LANCET, 1921, ii., 1124; 1922, i., 150.

[2] The annual reports of the County and City of Worcester Mental Hospital, Powick; Cumberland and Westmorland Mental Hospital; City of Leicester Mental Hospital, West Humberstone; and Borough Mental Hospital, Middlesbrough.

> " The comparatively big difference in the 5-year old group compared with the 8-year old group is hard to account , but evidently during the three intervening years some use or causes have been in operation affecting adversely e normal rate of development. Perhaps the zymotic seases play the important rôle, as they are more liable to tack children between 5 and 10 years of age. Again, the year old group was born in 1914, and the children were erefore affected by the food shortage of 1917–18."

Obviously the latter explanation ought to have fected the figures for 1921 as well as those for 1922. l school doctors and teachers have noticed the fference in the groups of children entering school ch year; one year there will be a fine, healthy crop children and the next year a poor one. Dr. C. J. homas in 1905 investigated very thoroughly groups children born in different years who had attained e ages of 8 to 13. He found that children born in year with a high child mortality rate were poorer hysically and mentally than children born in a year ith a low rate. The high mortality rate may have een produced by various causes—a hot, dry, dusty mmer with epidemic diarrhœa, or a year when fective disease was rife, carrying off a large number f children and weakening others. The younger the hild the greater the effect of any debilitating influence n growth. Out of a total of 2504 children inspected the routine group, 563 required actual treatment; 09 were found suffering from malnutrition, 53 from kin disease, 207 had enlarged cervical glands (nonuberculous). Of 1434 inspected by the dentist, 1171 ere referred for treatment, and 643 actually treated. r. O. M. Holden reports that the accommodation at he baths is inadequate for the needs of the schoolhildren and the inhabitants of the town, and urges n increase of washing facilities.

Warwickshire.

The school population here is about 37,500, distriuted between 314 schools, compared with 319 in 921, the reduction being due to the amalgamation f departments in several schools with a view to conomy of teaching staff. During the year 12,053 outine medical examinations have been made, and f these 16 per cent. were referred for treatment. t the school nurses' examinations of 15,660 children 0·3 per cent. were found with unclean heads, a slight mprovement on the 14·8 per cent. found in the revious year. Dr. A. Hamilton Wood finds it very isheartening to have to record that after 14 years f medical inspection so little attention is paid y parents and teachers to the uncleanly condition f children's heads, and says that too often the quesion is regarded by the head teacher as a matter for he school doctor and nurse, and one in which the eacher is not concerned. He finds in those schools here the teachers take an active interest in such natters that a high standard of personal cleanliness s obtained. Ringworm incidence, although about hundred cases less than last year, is high, amounting ltogether to 435 cases; 50 of these were given X ray reatment. Following-up is undertaken entirely by vhole-time health visitors in their capacity as school urses, to which they devote one-third of their time. This scheme appears to be working well. During the year they kept under observation 10,108 cases, reatment being obtained for 8948 of these. There were 23 fewer cases of enlarged tonsils and adenoids ecommended for treatment during 1922 compared with 1921, and only £18 was spent in connexion with the provision of free meals for necessitous children iving in the outskirts of the city of Coventry, as against 160 for the previous year. The reason for this is not clearly set out. This report is presented in foolscap form, and is somewhat unwieldy and difficult to handle.

EPSOM COLLEGE.—Founder's Day celebrations will be held on July 30th, when Lord Muir Mackenzie will distribute the prizes.

Correspondence.

"Audi alteram partem."

THE BEST DENTAL ANÆSTHETIC FOR CHILDREN.

To the Editor of THE LANCET.

SIR,—Mr. S. F. Rose's article in your issue of June 23rd, and Dr. H. Hilliard's letter in that of July 7th, prompt me to put forward the claims of nasal nitrous oxide and oxygen as a satisfactory anæsthetic in dental operations on children. Mr. Rose says that children take gas badly; Dr. Hilliard suggests that this is because they will not stand deprivation of oxygen. Why, then, not gas and oxygen?

The disadvantages of ethyl chloride as a dental anæsthetic in children, in comparison with nasal gas and oxygen, are, to my mind, that firstly, it is probably less safe; secondly, recovery is slower and after-results more likely (important points for a busy dentist, as well as for the patient); thirdly, it is less pleasant to take (with the result that the child is more likely to dislike any subsequent administration), and fourthly, the available anæsthesia is shorter. Mr. Rose advises immediate second or third doses to complete a difficult operation. The mental anguish and fear attending such a procedure in some children is, I am sure, very great, and I consider it unjustifiable unless it is absolutely unavoidable.

Undoubtedly children are more difficult subjects for nasal gas-oxygen than are adults, but nevertheless satisfactory results can be obtained. Children almost invariably induce quietly and easily without any contact between nose-piece and face being necessary, with the result that they usually do not mind the anæsthetic. Continued administration is the more difficult part, with a child's active reflexes, but, nevertheless, with experience, more satisfactory results than with ethyl chloride, as regards length of operation time and quick recovery, can almost always be obtained.

In unruly children, in whom cavity preparation is difficult, nasal gas-oxygen is a method offering a chance of completing work otherwise almost impossible. I can recall the case of a boy of 6 or 7, otherwise almost unapproachable dentally, in which three cavities were prepared and temporarily filled during an anæsthesia of about 20 minutes.

I never give ethyl chloride for dental work unless there be most unusual circumstances demanding it. I have only given it, in dentistry, once in the last three years, and then because the child was so spoilt and unruly that it was the only method in which he could not smash the apparatus. Such cases are rare.

I am, Sir, yours faithfully,

Harley-street, W., July 10th, 1923. STEPHEN COFFIN.

L'AFFAIRE SPAHLINGER.

To the Editor of THE LANCET.

SIR,—In writing to give you my personal opinion of the Spahlinger treatment, I cannot do better than quote the following case of my own:—

A man, aged 32, suffering from tuberculosis of the left kidney, the right kidney being sound (diagnosis by cystoscopy and ureteral catheterisation), and from non-fistulous right tuberculous epididymitis, had left nephrectomy performed on Oct. 30th, 1919, with no untoward after-effect. In May, 1920, began almost constant hæmaturia, with exaggeration of vesical symptoms. In the following July occurred left epididymitis, which opened rapidly by means of two fistulas. The right epididymitis increased, but did not become fistulous. I saw the patient again in August, when hæmaturia was still almost continuous. Having ascertained by means of the cystoscope that the latter was due to the remaining kidney, I decided that the tuberculosis must be localised on that side, and determined, in view of the gravity of the case, to try the Spahlinger treatment. From August 20th to Oct. 27th I gave several injections of serum (B.M.). There was a violent febrile reaction (max. 39·6°–40·2° C.), and painful reactions took place in the left testicle and in the operation wound, with increased hæmaturia, at the beginning of September. The hæmaturia ceased on Sept. 6th, and up to the present (July, 1923) has not reappeared. During the injections there was much suppuration from the fistulas in the left epididymis.

From the date of the last injection, Oct. 27th, the patient's general condition gradually improved. He was a mechanic, and in the spring of 1920 his bad health had forced him to give up his work: he is now working full time, with good general health, good colour, &c. His urine is opalescent with phosphates and muco-purulent débris; micturition is painless and takes place once nightly. The right epididymis is painless, rounded in shape, and the size of a nut: the nodular left epididymis is adherent to the skin of the scrotum at the level of the two dried-up fistulas.

It seems to me impossible to deny the good effect of the treatment in this case. The least that can be claimed is a distinct modification of the clinical course, and, of course, of the tuberculous lesion in the second kidney, which at the time of the nephrectomy was healthy. The patient was doubtless unfit to resist the second attack of the disease, and his general condition was rapidly growing worse. Since treatment, and in spite of resuming work, the evolution of the lesions appears arrested in both kidney and epididymis, and his general condition is that of a healthy man.

I am, Sir, yours faithfully,

CHARLES PERRIER,
Privat-docent, Chirurgien-Adjoint à l'Hôpital Cantonal, Geneva.

July 3rd, 1923.

To the Editor of THE LANCET.

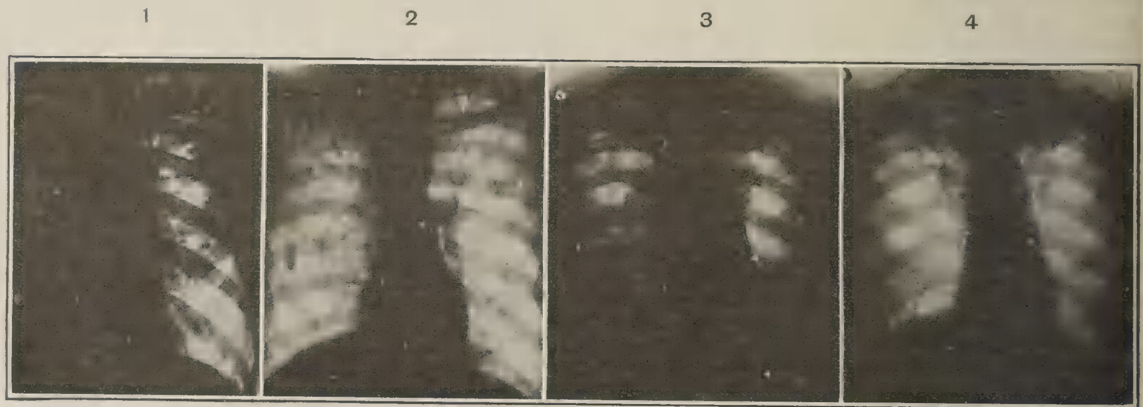
SIR,—I have had the privilege for the last eight years of having treated a number of cases with Mr. Spahlinger's partial sera and with his vaccines. Although I have never used the "complete" serum, I rapidly came to the conclusion that Spahlinger's partial sera produce most favourable results in the treatment of acute or severe tuberculosis, results which no other hitherto known treatment could give. A series of cases, mostly in an advanced and rapidly progressing stage of the disease when they came under my care, were treated with these antitoxins and are alive to-day, and engaged in their normal work. I quote four typical interesting cases:—

CASE 1.—F. L., male, aged 25. Patient had coxalgia at 9 years of age. Treated by extension and sea-baths, as a result of which condition improved. There remained, however, a permanent focus in the track of the fistulous opening. Up to the moment when Spahlinger's treatment was commenced, the patient had continual relapses, which necessitated frequent medical and surgical intervention. Three operations took place; the last one, which was of an urgent nature, was performed in 1915. It necessitated making an incision of about 8 inches and inserting four drainage-tubes. In order to dry up the suppurating lesion and to avoid abscess formation, which occurred after each preceding operation, patient was in 1915 treated with Spahlinger's vaccine. Cicatrisation of the wound rapidly took place and the suppuration disappeared. Treatmen was continued for eight months with one interruption of few weeks.

Examination in June, 1923, shows complete arrest of th disease. It is interesting to note that before Spahlinger' treatment was commenced, abscesses formed periodically necessitating continual care and preventing patient effectin a complete recovery. Since receiving the course of vaccin in 1915, patient has had no relapse whatever and for seve years has now been able to lead a normal life.

CASE 2.—G. V., male, aged 30. Four years ago patien had a severe hæmorrhage. Early in 1913, while working a Algiers, he suffered from violent cough, repeated attacks o hæmoptysis, weakness, breathlessness. Pulmonary tuberculosis was diagnosed. He received hospital treatment a Algiers with ensuing improvement. From March unti August, 1914, condition became slowly worse. Sent back t France. When patient came under my care in July, 1915 his chest examination showed extensive bilateral fibrocaseous infiltration with softening well marked at apices His cough was troublesome, the daily expectoration amounte to 8 oz., and T.B. were present in large numbers. Sligh rise of evening temperature. Frequent hæmorrhages Loss of weight 8 lb. during the last six months (normal weigh unknown). Night sweats. Dyspnœa very troublesome No appetite. Anæmia. Fainted on slightest exertion.

After a 12 months' course of Spahlinger's serum an vaccine the signs in chest had completely dried up, and general condition had much improved, when patient had sudden attack of hemiplegia, with a positive Wassermann He died the week following from a syphilitic gummata in th brain. His post-mortem revealed extensive scar tissu throughout both lungs.



Radiograms: 1. Case 3 when marked improvement had taken place. 2. Case 3 after recovery. 3. Case 4 when partial serum treatment was commenced. 4. Case 4. Radiogram taken one year after.

CASE 3.—H. N., male, aged 23. Patient contracte bronchitis in 1913. Cough ever since. In July, 1914, had hæmorrhage. In November, 1914, sputum examinatio showed T.B. + and pulmonary tuberculosis was diagnosed. He had a course of tuberculine injections at the beginning o 1915. Hæmorrhages in March and April. When patient commenced Spahlinger's serum treatment in May his chest examination showed infiltration of right upper and middle lobes and also at left apex. He complained of cough, profuse expectoration, often blood-stained, T.B. +, loss of weight, night sweats, temperature 101·1°F., pulse 110, dyspnœa, indigestion, diarrhœa, vomiting.

By July marked improvement had taken place, and treatment was stopped temporarily for want of antitoxins. In August new increase of activity, severe and prolonged attack of hæmorrhages. In November condition had become very critical, and a fatal termination appeared imminent. Temperature, 101·2–102·4°; pulse, 120; cough extremely troublesome; expectoration purulent, amounting to 9 oz. daily, numerous T.B. present, extreme emaciation, profuse night sweats, much dyspnœa, diarrhœa. Condition of collapse. Examination showed massive disease of the whole of right lung and scattered infiltration on left side. Serum treatment was resumed and antitoxins given in large doses. By end of December a slight but marked improvement had taken place. Patient could eat a little food and hæmorrhages had stopped, but he was still too ill to sit up in bed for thorough auscultation. End of February, 1916, he was allowed to get up. Temperature was then normal. Condition improved rapidly. In December, 1916, the disease was completely arrested, nevertheless serum ment was continued until end of 1917. Examination in shows that there is no trace of active tuberculosis in chest. Patient has no cough and no sputum. His ht is normal (41 lb. increase since December, 1915). e is still some dyspnœa present. He has been at work as rneyman tailor since 1917 up to the present day.

SE 4.—S. Y., woman, aged 42. Tuberculosis in family ry. Three sisters, one brother, and husband died of onary tuberculosis, and her only child died of tuberculous ingitis. Patient contracted pleurisy and pneumonia in . Went to sanatorium. In November, 1917, T.B. found in sputum. Hæmorrhages in June, 1919. rned to sanatorium. In January, 1920, went to Leysin in October to Davos, where she was diagnosed as a rmous form with marked process of caseation; she ined there until March, 1921, gradually getting worse. n patient came under my care in April, 1921, chest ination showed considerable caseous infiltration at upper lobe and infiltration at lower lobe. Rapidly ading disease at L. side with caseous infiltration of thirds of L. upper lobe and also infiltration at base of r lobe. Active softening at both apices. Her cough troublesome. The yellowish, purulent expectoration unted to 5–6 oz. daily, with numerous T.B. present in it. e 90–110. Loss of weight 1 st. 5 lb. Hæmoptysis. h dyspnœa.

fter two years of Spahlinger's partial serum treatment disease is now (June, 1923) completely arrested. Temture, pulse, and weight normal. There is a little cough phlegm in the morning, but since the beginning of 1923 sputum examination has always remained negative. ent is very well and leads a normal life. She is still iving partial serum injections once a week.

ome of the cases are still receiving once or twice a k an injection of partial serum, while awaiting a se of active immunisation which, unfortunately, navailable at present. On the other hand, the 11 ents I treated with Spahlinger's vaccine in 1915–16 e made a lasting recovery and have had no treatt whatever since their discharge. Two of these ents were suffering from tuberculosis of the bones, confirmed by bacteriological tests, and nine were nonary cases, with T.B. present in each sputum mination. Unfortunately three of them died sequently from diseases other than tuberculosis. remaining cases have been in perfect health for the seven years. They are able to lead a normal life, aged in active work, and on no occasion have they n any signs of relapse.

I am, Sir, yours faithfully,
DR. E. TRECHSEL.
neva, July 3rd, 1923.

MENTAL HOSPITALS SERVICE.

To the Editor of THE LANCET.

IR,—In your review of various mental hospital orts under the above title in THE LANCET of y 14th reference is made to The Retreat and to nwood House, Gloucester, under the heading wo Private Mental Hospitals." The two hospitals tioned are in reality "registered hospitals"—that o say, establishments managed by a voluntary mittee, none of whom have any pecuniary interest t. In this respect they are thus precisely on the e footing as the Scottish Royal Asylums. As the ase "Private Mental Hospital" properly refers, merely to institutions for private patients, but those which are managed for the profit of some son or company, I think it worth while to draw r attention to the inaccuracy.

I am, Sir, yours faithfully,
HENRY YELLOWLEES.
mel Beeches, York, July 17th, 1923.

** The heading was not intended to convey more n that the two hospitals mentioned were for private ients.—ED. L.

HE LINGUAL TONSIL IN RELATION TO THE SINGING VOICE.

To the Editor of THE LANCET.

IR,—In the condensed report of the discussion on Seymour Jones's interesting paper on the Lingual sil in THE LANCET of June 23rd, p. 1265, some akers suggested that too much importance might be attributed to it. There is, however, one of its aspects—namely, the effect of its enlargement on the singing voice—which I think is of considerable importance. Briefly, this condition interferes with the elevation of the epiglottis, which accompanies, and is probably essential to, the clear production of the higher notes. Removal of sufficient of the redundant portion to relieve the pressure on the epiglottis has been followed by increased comfort in singing, and by the gain or recovery of several notes. The point receives consideration in my lecture[1] on "Some Disturbances of the Singing Voice."

I am, Sir, yours faithfully,
London, July 14th, 1923. JAMES DUNDAS-GRANT.

THE RÔLE OF THE TOOTH-BRUSH.

To the Editor of THE LANCET.

SIR,—The letter of Sir John O'Conor, published in THE LANCET of June 2nd, has been read with interest, but also with great surprise. It is certainly most astonishing to find any one willing to make such sweeping statements that the daily use of a bristle tooth-brush is harmful, and at the same time offer nothing to corroborate his views. The fact that the gentleman states that dental caries and pyorrhœa come from the use of the tooth-brush shows the lack of careful investigation on his part. The correct brushing of the teeth and gums not only removes food debris, but strengthens and hardens the gums and stimulates the blood-supply to the teeth.

Had Sir John O'Conor stated that the ailments he enumerates are largely due to the use of foods which do not need mastication he would have more closely approached the truth. Hard and dry foods requiring mastication and insalivation will give the necessary exercise to dental organs and bring into proper play those functions which will keep the teeth and adjacent tissues in normal, healthy condition. Cooked foods, tinned foods, sloppy foods, bread made of wheat, from which all the most important elements have been removed, oatmeal drowned in milk and smothered with sugar, jams, sweets, mashed potatoes, and juicy tender flesh which dissolves and does not need much effort to masticate, these are far more productive of pyorrhœa and dental caries, gastric pollution, and appendicitis than are all the tooth-brushes ever made since time began. In the conditions and environments that men live to-day, the tooth-brush is a necessity for the maintenance of mouth hygiene. In the United States we are collecting a vast amount of valuable data showing the importance and value of using the tooth-brush three and four times a day.

The oral hygiene movement has taken a firm hold in our country and there are signs that the people of England are taking up this subject with zeal and thoroughness. In the city of Bridgeport, where the daily use of the tooth-brush has been taught in every public school for the past five years, and where every school child has a tooth-brush, a large reduction of children's illnesses has already been recorded. A large reduction of dental caries and a 50 per cent. reduction in backward children has also been secured. During the past eight years over 50,000 cleansing operations have been given to the employees of the Metropolitan Life Insurance Company. Instructions are also given for the proper use of the tooth-brush. In all these years and for all these thousands of persons there has not been one case of pyorrhœa, dental caries, gastric pollution, appendicitis, or organism decomposition that has been traced to the daily use of the tooth-brush. Nay, further, it can be shown that the improvement in general health has been so marked, that whereas, during the first four years it was optional with the employees to have their teeth cleansed, now it is a rule of the company that every one of its seven thousand employees must have two cleansings each year. Dr. Geis and Dr. Kleiger of Columbia University found that one milligramme of tooth scrapings in an uncared for mouth contained from five to eight hundred million bacteria by count and weight, whereas, in one milligramme of tooth scrapings in a fairly clean mouth there were approximately only five million. It can be safely stated that the bacteria found in a clean mouth are to all intent and purpose practically harmless, whereas those that are found in a dirty mouth become virulent and dangerous. Another factor is the question of the health of the soft tissues of the mouth. When the soft tissues of the mouth are in a normal condition, they are practically impervious to bacterial life, but when the gums become inflamed, they then become open gateways for the entrance of disease germs into the circulatory system of the body.

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[1] Clinical Journal, 1913, xlii., 504–5.

Nothing will bring about more quickly an inflamed condition of the soft tissues surrounding the teeth than the lack of proper and sufficient mastication upon hard foods and the presence of decaying particles left from mushy meals. The formation of calcium deposits also causes inflammation of the gums. By the proper use of the bristle tooth-brush and tooth-powder and rinsing the mouth with lime-water after cleansing will do more for the hardening and strengthening of the gums, the prevention of pyorrhœa, and dental caries than any other known remedy. I have yet to see a patient who uses a badger-hair tooth-brush who did not have a mouth reeking with food debris a week old, and with inflamed gums and pus discharge. Until the food habits of the entire civilised world are changed, bristle tooth-brushes are a necessity for the maintenance of mouth hygiene.

I am, Sir, yours faithfully,
THADDEUS P. HYATT, D.D.S., F.A.C.D.

New York City, July 5th, 1923.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg. Rear-Admiral J. Shand will be succeeded by Surg. Rear-Admiral J. F. Hall in charge of the Royal Hospital, Malta.

Surg. Vice-Admiral Sir R. Hill, Director-General of the Medical Department of the Navy, to be Honorary Surgeon to His Majesty, vice Inspector-General of Hospitals and Fleets W. H. Lloyd, deceased.

Surg. Rear-Admiral G. A. Dreaper is placed on the Retd. List.

Surg.-Capt. A. Gaskell to be Surgeon Rear-Admiral.

D. H. Kernohan is entered as Surg. Lieut. for short service.

ROYAL ARMY MEDICAL CORPS.

Temp. Hon. Lt.-Col. T. E. K. Stansfield relinquishes his commn. and retains the hon. rank of Lt.-Col.

Lt.-Col. A. F. Carlyon, late R.A.M.C., half pay, retires on account of ill-health contracted on active service.

The undermentioned retire on ret. pay: Lt.-Col. G. H. Goddard on account of ill-health; Maj. R. J. C. Thompson on account of ill-health contracted on active service (and is granted the rank of Lt.-Col).

Capt. R. W. Galloway relinquishes the temp. rank of Maj.

Temp. Capt. F. J. P. Daly relinquishes his commn. and retains the rank of Capt.

ARMY DENTAL CORPS.

Lt. N. H. Medhurst to be Capt.

TERRITORIAL ARMY.

Maj. J. V. Bates (late R.A.M.C.) to be Capt., and relinquishes the rank of Maj.

Lt. J. W. Macfarlane to be Capt.

Lts. J. R. Oddie (from 5th Bn. West Yorkshire Regt.) and A. Badenoch (late R.G.A., T.F.) to be Lts.

TERRITORIAL ARMY RESERVE.

Lt.-Col. E. J. D. Taylor (from 5th Southern General Hospital) to be Lt.-Col.

Capt. P. E. H. Adams (from 3rd Southern General Hospital) to be Capt.

INDIAN MEDICAL SERVICE.

Lt.-Col. H. Ainsworth to be Colonel.

The King has approved the retirement of Lt.-Col. S. H. Burnett.

SIXTH CONGRESS OF THE INTERNA TIONAL SOCIETY OF SURGERY.

THE International Society of Surgery is hold this week, July 16th to 20th, its Sixth Triem Congress, the first to be held in this country, the house of the Royal Society of Medicine, 1, Wimpole-street, under the presidency of Sir Willi Macewen, F.R.S.

MONDAY, JULY 16TH.

On Monday members obtained detailed p grammes for the week; only a business meeting the international committee took place. On t evening a conversazione was held at the Univers of London; members of the Society and lad were received by Mr. H. J. Waring, Vice-Chancel of the University, and Mrs. Waring, and had opp tunities of renewing old acquaintances and mak new ones. The band of H.M. Scots Guards play musical selections and light refreshments w provided.

TUESDAY, JULY 17TH.

INAUGURAL SESSION.

On Tuesday, at 11 A.M., the inaugural sessi was opened by H.R.H. the Prince of Wales. Royal Highness was received by Sir Wm. Hale-Whi President of the Royal Society of Medicine, and sign the roll as an Honorary Fellow. He was then w comed by the President of the Congress and present with the Society's medal in gold. The Prince refer to the international aspect of the gathering, n for the first time meeting in Great Britain in t house of a Society of which he was an honora member, and welcomed the delegates and memb from other countries. Modern surgery was, pointed out, the outcome of international coöpe tion, since it owed its inception to the work of Paste and Lister. A special welcome was extended Dr. W. W. Keen, of Philadelphia, the doyen of t Congress. Lord Curzon welcomed the delegates behalf of the Foreign Office. Such meetings, he sa while they might produce fruitful rivalry betwe nations, were a valuable part of the machinery international amity. He wished he could app surgical methods to the ills of the body-politic wi the same accuracy and prospects of success. Neville Chamberlain hoped the Congress would attended with results fruitful to mankind. Alrea no more useful advance had been made in a branch of science than in surgery; much progr had been achieved in the late war, notably in plast or reconstructive surgery. Illness resulted in econom loss, and anything that tended to cure disease shorten it deserved the gratitude of all natio Mr. J. E. H. Roberts, the British delegate, brie welcomed foreign delegates, and thanked them f choosing London as the venue for the Congres The following delegates were then presented to H Royal Highness: Dr. Bruce (Canada), Dr. Zacharie (Czecho-Slovakia), Dr. Hansen (Denmark), Petridis (Egypt), Prof. Hartmann (France), Koch (Holland), Dr. Allessandri (Italy), Dr. Nic laysen (Norway), Dr. de Zawadski (Poland), Kayser (Sweden), Dr. de Quervain (Switzerlan and Dr. MacArthur (United States). Prof. Willem President of the International Committee, aft thanking the Prince of Wales for his presence a gracious words, pointed out that this was the fir occasion upon which the President was a subje of the country where the Congress was held. list of the members whom the Society had lost sin its last Congress was read.

Dr. L. Mayer, Secretary-General, cognisant of t Prince of Wales's knowledge of that language, spoke French, and thanked the Prince and the Ministers f their presence at the inaugural session. He referred the lamented death of Sir Charles Ryall, whose pla as organising secretary had been taken with co spicuous success by Mr. Roberts, to whom, with S

Arcy Power, the thanks of the Congress were due the splendid organisation. The President of the iety, Sir William Macewen, delivered an address in ich he suggested that much could be learnt about man anatomy from a study of animals. The wth of a stag's antlers, for instance, provided a cinating subject which might well provide an ight into the growth of bone. In three months the g produced a complicated pair of antlers composed solid bone covered by a vascular "velvet." Yet se bony excrescences grew from the frontal bone ich was covered by pericranium, a membrane which, n according to the orthodox view of the osteo-etic function of periosteum, had only the most agre bone-forming powers. In a few months more antlers underwent a process of aseptic sclerosis d death, and were finally shed, this being contrary to tchnikoff's theory that senility of tissues was the ult of bacterial invasion. Histological examination the antlers made it possible to recognise the eoblasts by their form, and to trace them through the stages of growth and shedding. Sir William cewen was sceptical of the theory that mesoblastic ls had the property of converting themselves into y other form of mesoblastic cell, and stated his lief that bone-cells were invariably developed from ne-cells, and that certain bone-cells had inherited ater osteogenetic power than others. It was well at it should be so, for otherwise bony injuries would duce serious deformities ; 40 years ago he had been le to prove that bone grew from bone, by reproducing humerus from pieces of bone removed from other man subjects.

FIRST SCIENTIFIC SESSION.

The first scientific session, held on the afternoon of esday, was devoted to the surgery of the endocrine nds.

Surgery of the Thymus in Early Life.

Dr. Victor Veau (Paris) said that enlargement of e thymus, which was responsible for many deaths infancy, was amenable to surgery. Thymectomy s an easy operation, devoid of any serious risk and rative if the diagnosis were correct. But as there ust always be a little doubt about the diagnosis d as a similar result could be obtained by one or two ses of X rays he preferred now to employ radio-erapy rather than surgery. The X rays were not together devoid of risk ; should this risk prove to be rious he would revert to surgery.

The Splenic Syndromes.

Dr. W. J. Mayo said that the spleen was chiefly a echanical filter, which removed degenerated red lls and toxic agents from the blood. It sent them to the liver for further detoxication ; it also veloped lymphocytes. The function of the normal leen was not important, but the diseased spleen was serious menace to the constituents of the blood and the liver. The spleen did not initiate the patho-gic processes with which it was concerned, but acted a secondary agent. The removal of the spleen in e splenomegalies and in certain blood conditions moved a pathologic agent. A spleen that was ronically enlarged and did not yield to reasonable edical treatment should be removed early, unless in e individual case there were contraindications to lenectomy.

Two hundred and ninety-five splenectomies had en performed at the Mayo Clinic, and all the deaths ere classified as being due to the operation.

Splenomegalies due to Micro-organisms.

Cause.	No. of splenectomies.	Deaths.	Results.
ronic syphilis	8	1 ..	Good in 7 cases.
iberculosis	4	1 ..	,, 3 ,,
ogenic organisms ..	14	4 ..	,, 6 ,,
lenic anæmia	82	9 ..	,, majority.

Hæmolytic Icterus.—Forty-two splenectomies were rformed for this condition, one died in hospital, and recovered perfectly.

Pernicious Anæmia accounted for 57 splenectomies ; there were three deaths in hospital, but no deaths amongst the last 40 patients prepared by blood transfusion, and the improvement in all was more prolonged than in that following blood transfusion alone ; there were no cures, but the abnormal blood picture improved. He thought splenectomy in cases of pernicious anæmia was only justified in a limited number of carefully selected cases.

Polycythæmia Rubra Vera.—One splenectomy was performed for this condition. There was great improvement. The patient was able to work.

Hæmorrhagic Purpura (essential thrombohæmia).—One splenectomy was performed with good result.

Splenomyelogenous Leukæmia.—Twenty-nine splenectomies were done for this disease with only one death in hospital, and great temporary benefit in 28. The condition of the blood was improved, but was not normal. The other 59 miscellaneous cases were not discussed in this paper.

Some Points in the Surgery of the Suprarenals.

Drs. Ch. Willems (Liége) and N. Goormagtigh (Gand) said : In classifying suprarenal tumours, the morphological, functional, and embryonic distinction between the cortex and the medulla was most important. The "cortico-surrénalomes" were the most frequent, while the tumours of the medulla were most rare and belonged to two groups—those of nervous origin, and those of chromaffin origin.

The syndrome of Sargent-Bernard presented an acute form corresponding to the destruction of the glands, and a less serious form which probably corresponded to partial lesions. This was, however, controversial. The former had the appearance of an intoxication, while the latter form presented as principal symptoms hypotension and asthenia. The excision of one of the healthy suprarenals, with the idea of lessening the amount of suprarenal substance, had been performed, especially for epileptic fits. The results obtained were interesting, but the problem was far from solved. The removal of the suprarenal had also been performed in cases of hypertension, so as to reduce the suprarenal functions. Of the two ways which had been used for the extirpation of the healthy suprarenal, the transperitoneal one was not the handiest in spite of its appearance. The retroperitoneal way, according to the technique of the authors, was more advisable, being more accurate and giving the required view.

Pituitary Surgery.

Mr. Percy Sargent (London) said that considerable progress in pituitary surgery had been made since Victor Horsley's pioneer operations of more than 20 years ago, but there was still much to be learnt. Operation might be directed to (*a*) influencing the secretory output, (*b*) relieving local pressure symptoms, (*c*) relieving general intracranial pressure. Total removal of a pituitary tumour was impracticable, but partial removal might be of great benefit. In some cases a simple decompression operation was all that could be done, and might be very beneficial, even as regards vision. The causes of failure, in the speaker's opinion, were : (i.) errors of diagnosis leading to misdirected operations; (ii.) massive intracranial extension of the tumour, rendering the case unsuitable for any operation except a palliative decompression ; (iii.) operative accident ; (iv.) post-operative pneumonia ; (v.) in trans-sphenoidal operations, septic infection.

The osteoplastic frontal approach was the procedure chosen in most cases ; the trans-sphenoidal operation, although presenting certain advantages, was incapable of affording more than partial and transient relief. Advance in pituitary surgery must come about through improved diagnosis, wiser selection of cases, and earlier operations.

Surgery of the Thymus.

Dr. Lorthior (Brussels), after a brief reference to the possible function of the thymus gland, went on to discuss the indications for its removal, the chief of which was thymic asthma; there were other indications, such as laryngismus stridulus, respiratory embarrassment leading to debility and arrested mental development, intolerance of anæsthetics, &c., and their number was increasing. After removal of the thymus there was often a striking improvement in the general condition of the child, in its intelligence, vitality and rate of growth, resembling the effect of removal of adenoids. The operation was conducted as follows. After being anæsthetised (the reporter's preference was for chloroform, although other general anæsthetics, ether, nitrous oxide, &c., could be employed) the child was placed in Rose's position and a small incision about one inch in length was made vertically upwards from the suprasternal notch. The muscles having been separated, the thymus in its capsule was seized with forceps when it appeared from behind the sternum during expiration; the capsule was opened and the gland substance proper seized with forceps. From this moment the hold upon the gland by forceps must not be released until the gland had been removed by gentle and patient traction. As each succeeding portion appeared it was grasped with fine Kocher's forceps which provided a fresh hold for further enucleation until the whole or almost the whole gland came away. There was never any appreciable hæmorrhage, the vessels being very small; only very occasionally it was necessary to crush a vessel of unusual size and ligature of vessels was never called for. The operation was completed by closing the skin wound with a few Michel's clips. The mortality of this operation had, up to the present, been nil; it was easily performed and the results had been most gratifying.

Discussion.

Mr. H. Henry (Dublin), who had found that the difficulty in Cushing's nasal approach to the pituitary gland arose chiefly from the variations in the sphenoidal sinus, exhibited an instrument by which he had been able to overcome these difficulties. The instrument consisted essentially of a metal tube attached variably to an apparatus which gave a firm attachment to the hard palate. The tube was passed into the submucous resection wound and guided into position by observations with the X rays, the operation being conducted in the X ray room. When in position the pituitary could be attacked under direct vision by means of instruments similar to those used with the operating cystoscope.

Testicular Grafting.

Dr. Serge Voronoff (Paris) described the objects and technique of testicular grafting which he had now performed in 44 cases in the human subject. After much experiment he had now devised a method which ensured long survival of grafts of fresh chimpanzee testicle into the human tunica vaginalis testis. The results of this method employed since 1920 had been both marked and, up to the present, permanent. The phenomena observed were a lowered blood pressure, reduction of weight in obese subjects, better vision in hypermetropes as the result of improved elasticity of the lens, new growth of hair, and improved muscular power and mental activity. To obtain such results it was necessary to use the testicles of monkeys of full growth and unmistakable virility; where the testes of young monkeys, in whom the internal secretion was not developed, were used no benefit had accrued. This proved that the results were not born of auto-suggestion. He appealed to other surgeons to try the operation when he was convinced they would realise its value.

Mr. Ivor Back (London) had seen Dr. Voronoff's work at Paris and talked with his patients, most of whom were themselves medical men, and was convinced of the value of testicular grafting. The effects of the removal of the testicular secretion by castration were well-known and the restoration of the internal secretion of the testes could, and did, restore many of the functions which decayed with age. The difficulty had been to find a suitable place where the grafts would survive. If placed under the skin or in the peritoneum they were absorbed, b with Dr. Voronoff's present method of implanti the grafts into the scarified tunica vaginalis, whe each was anchored by a suture, they survived lo enough to obtain a blood-supply; histological pro of this survival was obtained. The chimpanz was selected as the donor on account of its clo relationship to man; the excised testicle was cut in six segments and three were implanted into t interior of the tunica vaginalis of each testicle of t recipients. It was found that grafts of this size becan vascularised in about 48 hours and survived. smaller grafts were used they were absorbed an if larger they were apt to undergo necrosis at lea in part.

Thyroid Transplantation.

Dr. A. Kocher (Berne), who had performed thyro transplantation in 214 cases with only 14 per cen of failures, described the operation as suitable, the words of his late father, Prof. Th. Kocher, "f slight cases of thyroid deficiency," and preferab to thyroid medication. The most refractory cas were those of congenital absence of the thyroid, bu three out of ten of such cases were improved, in or case sufficiently to take a university degree. Th method employed was to implant portions of huma thyroid not larger than a cherry, taken preferabl from the upper pole of an exophthalmic goitre, int the peritoneum, where they were fixed by sutur or into the medullary cavity of the tibia. Patien must take thyroid before and for a little while aft operation or the graft would not survive, whi about half the patients had to supplement wi thyroid medication after the operation, although t quantity required was always much reduced.

Dr. Froell (Stockholm) described the histolog of different varieties of goitre and their associat blood changes. He had found that the pH co centration was high in toxic and low in ordina goitres.

Use of Insulin in Surgery.

Dr. F. G. Banting (Toronto) said that insuli could have no effect on diabetic gangrene, as th was the result of arterial change; the use of insuli would, however, render the subject sugar-free, an permit of operation for gangrene or for any acut condition, such as appendicitis in a diabetic subjec

Suprarenal Grafting.

Mr. F. C. Pybus (Newcastle-upon-Tyne) describe a successful case of suprarenal grafting for Addison disease. The patient, who had previously been di charged from hospital as incurable and on the poi of death, made a striking recovery after havin suprarenal (from a healthy adult who died of a accident) grafted into the subcutaneous tissue The blood pressure rose, pigmentation disappeare muscular power was restored, and the blood pictur which had previously been that of pernicious anæmi returned to normal. The man was able to retur to light work for three years, when the symptom recurred, and a fresh grafting was performed; n traces of the original graft could be found at th second operation. A second case in which a supra renal graft from a male was implanted into a femal was unsuccessful, as were also two attempts to gra pancreas into the subjects of pancreatic diabete though in one of the latter cases there was a sligh and transient lessening of the glycosuria.

Dr. Juracz (Posen) described the effect of stimu lating doses of X rays on the suprarenals in a seve case of asthma. The patient, though not cured, wa much relieved, and one attack was cut short by th use of the X rays. Attempts to benefit cases exophthalmic goitre by destructive doses of X ray directed to the suprarenals had also been made, bu with less success.

Pituitary Tumours.

Dr. Krinski (Warsaw) described his experienc with these tumours, and Mr. A. J. **Walton** (London advocated the frontal approach as the only one b which reasonably good access could be obtained nasal route gave insufficient access to tumours were generally more intracranial than sella, carried a risk of sepsis. If approached by ley's temporal route the operation was embar- d by a number of cranial nerves and the internal id artery, whereas the frontal route gave excel- exposure when the tumour protruded (as it st invariably did) in front of the optic chiasma. his route he had removed pituitary tumours, elieved completely, in seven cases with three ns following operation and one remote death. remaining three cases were strikingly improved.

the evening a reception was held by Sir William Lady Macewen at the Royal Society of Medicine, e course of which the President gave a popular re on the Growth of Bone.

(To be continued.)

Medical News.

NIVERSITY OF LONDON: *King's College Hospital cal School.*—The following awards have been made:—rney Yeo Scholarships: G. F. Taylor, Sidney Sussex Coll., ridge; M. E. Lampard, Corpus Christi Coll., Cambridge; . Thornton, Magdalen Coll., Oxford; J. A. Eyres, Lincoln Oxford. Epsom College Scholarship: R. P. Ross, Gonville Caius Coll., Cambridge. Senior Scholarship and Tanner for Obstetric Medicine: W. P. H. Sheldon. Jelf Medal: ockington. Todd Prize and Medal for Clinical Medicine: Brockington. Class Prizes: Diseases of Children and pædic Surgery, W. P. H. Sheldon; Medicine, R. Cove- a; Surgery, H. C. Edwards; Obstetric Medicine, F. kington; Pathology, C. E. Newman; Forensic Medicine Psychological Medicine, M. A. Paul; Hygiene, L. H Savin.

iversity College.—The following awards in the Faculty edical Sciences have been made: Bucknill Scholarship), R. L. Midgley; Medical Entrance Exhibitions (1922), I. Madge and V. Freeman; Sharpey Scholarship, . Parkes; Cluff Prize, G. F. H. McCormick; Schafer , Dr. Katherine Coward; Gold Medal for Anatomy ior Class), G. F. H. McCormick; Silver Medal for omy (Junior Class), H. Awrounin; Gold Medal for iology (Senior Class), G. F. H. McCormick; Silver Medal Organic and Applied Chemistry (General Course), I. Sargent. Silver Medal for Pharmacology (General se), Beatrice G. Smith.

NIVERSITY OF OXFORD.—*Radcliffe Scholarship in macology.*—This scholarship has been awarded to ert Benedict Bourdillon, sometime Fellow of University ge.

eodore Williams Scholarships.—The following awards been made:—In Physiology: Ormond Alec Beadle, College; in Human Anatomy: John Samuel Jerome, st Church; in Pathology: George Payling Wright, er College.

it Fellowship.—John Maurice Hardman Campbell, College and Magdalen College, chief clinical assistant e Neurological Department at Guy's Hospital, has been ed by the trustees to a Beit Memorial Fellowship for cal Research.

NIVERSITY OF MANCHESTER: MEDICAL DEGREE .—The Vice-Chancellor, Sir Henry Miers, on July 14th, s address said that the professional training for medicine surgery was so exacting that the medical student had or no time for an acquaintance with research. Year year new subjects were added to the curriculum, but ing was ever taken away from it. No other degree se was so long or so expensive. The time available for y of the special subjects was so short that their y was necessarily somewhat perfunctory. The medical iculum was made up of a whole series of incomplete nents, because the general practitioner might be called in the course of his practice to face problems connected any of them. The medical profession was the most onsible of all professions, and we could not afford to ect any part of the curriculum. He thought that in re the universities might give to their old students resher courses" to which medical men in the district t come without too great a sacrifice of their time. Dental Board had tried such an experiment last year in iding lectures by eminent specialists at several university res, of which Manchester was one. There was no e in England where the opportunities of medical training greater than they were at Manchester with a group of itals serving the needs of a dense population.

Degrees were granted and awards made as follows:—

M.D. Examination.

J. C. Bramwell (awarded gold medal), C. H. Broomhead, Eugenia R. A. Cooper (awarded gold medal), Georgiana M. Duthie (awarded commendation), Ruth E. C. Verney, W. H. Wood (awarded gold medal).

Final M.B., Ch.B. Examination (Old Regulations).

Greta Lowe, Louis Magenstern, Leslie Morris, G. T. Robinson, G. B. Stenhouse, and Geoffrey Talbot.

Final M.B., Ch.B. Examination (New Regulations).

Arnold Brown, W. B. Bacon, *§Arthur Barlow, Bernard Bowman, §A. J. E. Cave, *‡Albert Coleman, Gordon Crompton, N. L. Edwards, W. E. Fildes, W. A. J. Fleming, ‡E. J. Foulds, ‡Allen Glenn, *‡§Marjorie A. Grant, Evelyn M. Holmes, §K. H. Jackson, A. M. Jones, H. M. Levy, Miles Parkes, Donald Ramage, *‡G. C. Sharp, Margaret Simcock, ‡Wilson Smith. §W. G. Southern, and †§L. J. Witts.

* Awarded second-class honours. † Awarded first-class honours.
‡ Distinction in Forensic Medicine.
§ Distinction in Hygiene and Preventive Medicine.

Obstetrics and Surgery.—William Broadhurst, Madge E. Heywood, Bertha Kahn, A.C.Kelly (distinction in Obstetrics), W. B. McKelvie, Gladys F. A. McLean, Marjorie M. O'Dea, R. W. Parker, W. M. Roberts, Marjorie Robinson, Kate B. Scott, Agnes Seaston, Marjorie Thompson, Sarah Walker, Jane M. Wilde, and Marjorie Youatt.

Obstetrics.—C. N. Aldred, V. F. Lambert, and Thomas Pierson.

Forensic Medicine.—Bessie E. Cook, R. W. Fairbrother, and Thomas Pierson.

Hygiene and Preventive Medicine.—C. N. Aldred, Bessie E. Cook, R. W. Fairbrother, Thomas Pierson, H. F. Shaw, and Robert Slater.

Surgery.—J. F. Bromley.

UNIVERSITY OF DURHAM.—At Convocations held recently the following degrees were conferred:—

Doctor of Medicine.—Neil R. Beattie, Douglas G. P. Bell, Thomas H. Bates, Oliver Colville, Samuel W. Davidson, Charles N. Gover, and Stanley Worthington.

Doctor of Medicine for Practitioners of Fifteen Years' Standing.—William H. Bennett, Philip H. G. Gosse, and William L. Hodge.

Master of Surgery.—Ruth Nicholson.

Bachelor of Medicine and Bachelor of Surgery.—Reginald Armstrong, Helen Austin, Monica F. Bell, William A. Brown, Katherine M. Cellan-Jones, George A. Fothergill, Irene B. M. Green, Phillis Hall, Robert E. Haswell, Gwendolen M. Hunton, Bernard R. Isaacs, Edward H. Jaques, John E. D. Miller, Louis Minski, Doris H. Motyer, Ian M. McLachlan, Francis G. Mundell, George C. Parkin, Georgena L. Philipson, Henry N. Popham, George C. E. Reffell, Leslie F. Richmond, Henry C. Rollin, William O. Rubidge, Evelyn M. Scott, Kathleen Shelton, William F. O. Taylor, Arthur Todd, Pieter J. G. de Vos, Hugh A. Wallace, Alexander J. Watson, and John C. Yeoman.

Bachelor of Hygiene.—Neil R. Beattie.

Diploma in Public Health.—Neil R. Beattie.

Licence in Dental Surgery.—Bernard Benjamin, Walter L. Fleming, George Johnson, Uel Magnus John, George J. S. Littlefield, Charles H. Miller, William Murray, George S. Page, and Bernard J. G. Phillips.

UNIVERSITY OF ABERDEEN.—The following degrees have been conferred:—

Doctor of Medicine.

Douglas W. Berry (honours for thesis), James S. Anderson (commendation for thesis), Andrew Topping (commendation for thesis), Dorothy E. Bryant, Alexander C. Fowler, and Louise Tomory.

Bachelor of Medicine and Bachelor of Surgery.

With First-class Honours.—*Allan W. Downie, *Richard D. Downie, and *Alexander Lyall.

With Second-class Honours.—†Alexander G. Badenoch, William H. Harris, Charlotte S. Hendry, and †Ian W. Laing.

Ordinary Degree.—George M. Anderson, Margaret J. Anderson, James Burnett, Janet F. Burnett, Charles W. M. Cameron, Catherine J. Clark, John Clarke, Patrick G. Currid, Robert Davidson, Douglas Dean, Elizabeth A. Dunbar, Mary Esslemont, Eric C. Gordon, Murdo McKenzie Gunn, Eleanor M. Henderson, James S. Hutchison, Archibald J. Ironside, Eric J. Jolly, Bernard W. MacDonald, Finlay MacLean, †Florence J. Malcolm, John C. Milne, Hugh W. Mulligan, Robert G. Munro, Forbes R. Mutch, James H. Peters, Margaret J. Rennet, Ernest R. Sorley, John S. Taylor, Lily M. Watt, Francis L. Webster, Mabel Wilson, and Maude Wilson.

* Passed Final Professional Examination with much distinction.
† Passed Final Professional Examination with distinction.

Diploma in Public Health.

Isobel C. Brown, Evelina I. Corbett, Thomas J. Davidson, George L. Duncan, Ethel E. M. Gray, Elizabeth G. McCurrach, Norman M. Maclennan, Alexander E. Reid, Harry E. Smith, Christina Stuart, Andrew Topping, and Alice M. Watt.

The following awards have been made:—The Struthers Medal and Prize in Anatomy, John W. Foster: "A Series of Preparations illustrating the Comparative Anatomy of the Temporo-mandibular Articulation." The Lizars Medal in Anatomy, John W. Foster, Arthur J. W. Wilkins (equal). The John Murray Medal and Scholarship (awarded to the most distinguished graduate in medicine (M.B., Ch.B.) of the year 1923), Alexander Lyall, M.A., Aberdeen.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—A quarterly Council meeting was held on July 12th, with Sir Anthony Bowlby in the chair. The President announced that at a meeting of the Fellows on July 5th five Fellows were elected into the Council in the vacancies occasioned by the retirement in rotation of Sir Charters J. Symonds and Sir Herbert Waterhouse, by the deaths of Sir William Thorburn and Sir Charles Ryall, and by the resignation of Mr. F. F. Burghard. The result of the poll, at which 1052 Fellows voted, was as follows:—

	Votes.	Plumpers.
James Berry	612	6
George Ernest Gask	466	28
John Herbert Fisher	445	53
Percy Sargent	445	3
William Sampson Handley ..	433	8

The above were therefore elected and Mr. Handley becomes substitute member of Council for Mr. Burghard until July, 1929, and Mr. Sargent becomes substitute member of Council for Sir William Thorburn until July, 1930. Messrs. Berry, Fisher, Handley, Sargent, and Gask took their seats on the Council.—Diplomas in Public Health were granted, jointly with the Royal College of Physicians, to 19 candidates. Diplomas in Psychological Medicine were granted, jointly with the Royal College of Physicians, to eight candidates.

The following professors and lecturers were appointed for the ensuing year:—

Hunterian Professors.—Robert Lawford Knaggs: One lecture on Leontiasis Ossea and one lecture on Osteogenesis Imperfecta. William Sampson Handley: One lecture on General Peritonitis. Charles Max Page: One lecture on the Operative Treatment of Osteoarthritis. Kenneth Macfarlane Walker: One lecture on the Internal Secretion of the Testis. Alexander Fleming: One lecture on the Employment of Antiseptics in Local and General Infection. Geoffrey Jefferson: One lecture on Injuries of the Cervical Spine. Frank Cook: One lecture on Toxæmias of Pregnancy. William Edward Gallie: One lecture on an Experimental and Clinical Study of the Use of the Fibrous Tissues in the Repair of Anatomical Defects. Sidney Forsdike: One lecture on Cancer of the Cervix. Ranald Montagu Handfield-Jones: One lecture on Retro-peritoneal Cysts—their Pathology, Diagnosis and Treatment. Ralph St. Leger Brockman: One lecture on the Problem of Drainage in Acute Appendicitis. W. H. Ogilvie: One lecture on the Infections of the Upper Alimentary Tract.

Arris and Gale Lecturers.—Hugh Ernest Griffiths: One lecture on the Relation of Diseases of the Gall-bladder to the Secretion and Functions of the Stomach and Pancreas. Cecil Pembrey Grey Wakeley: One lecture on Some Actions of Radiations on Living Tissues. Victor Ewings Negus: One lecture on New Points in the Mechanism of the Larynx.

Erasmus Wilson Lecturer.—Samuel George Shattock: Six Demonstrations on Pathological Specimens in the Museum.

Arnott Demonstrator.—Sir Arthur Keith: Six Demonstrations on the Contents of the Museum.

Sir John Bland-Sutton was elected President, and Sir Berkeley Moynihan and Mr. H. J. Waring were elected Vice-Presidents for the ensuing year.

ROYAL SOCIETY OF ARTS.—The Council of the Society attended, on July 13th, at Clarence House, St. James's, when the Duke of Connaught, President of the Society, presented the Albert Medals of the Society to Sir David Bruce and Sir Ronald Ross "in recognition of the eminent services they have rendered to the Economic Development of the World by their achievements in Biological Research and the Study of Tropical Diseases."

SOCIETY FOR THE PREVENTION OF VENEREAL DISEASE.—At its annual meeting, held on July 13th, a resolution was unanimously carried accepting the Trevethin Report as a document supporting the six essentials of the policy of the Society—namely, that:—

1. A man who after exposure is properly and thoroughly disinfected by disinfectants of appropriate nature and strength, runs little risk of infection.
2. An intelligent man if furnished with reasonable instructions can, in favourable conditions, effectively disinfect himself.
3. The adoption of skilled disinfection (in disinfecting centres) is not to be recommended as part of any general system, for reasons of time, cost, and impracticability.
4. The instruction by medical officers of venereal disease clinics of male persons attending such clinics, in the preventive use of disinfectants, offers a useful means of educating the community.
5. There is no evidence of facts in support of the view that any system of disinfection would tend to increase the number of exposures and raise the disease rate.
6. The law should be altered so as to permit properly qualified chemists to sell ad hoc disinfectants, provided such disinfectants are sold in a form approved and with instructions for use approved by some competent authority.

In view of the unqualified acceptance of the Trevethin Report by the National Council for Combating Venereal Disease, the Society is prepared to form a joint committee with the National Council, under the chairmanship of Lord Dawson of Penn, to watch and further the policy based on the terms of the Trevethin Report.

ROYAL NORTHERN HOSPITAL, LONDON. —
foundation-stone of the new casualty department, wl
constitutes the Borough of Islington war memorial, was
by Lady Patricia Ramsay on July 12th.

EXTENSION OF BLACKBURN ROYAL INFIRMARY
The complete scheme for this institution, which ser
North-East Lancashire, is estimated to cost £200,000.
has been decided to begin with an extension involving
expenditure of £75,000. This extension is intended as
town's war memorial.

LONDON HOSPITAL MEDICAL COLLEGE.—A lect
for senior students of the hospital and post-graduates
the Treatment of Puerperal Sepsis (a new method illustra
by charts) will be given by Dr. S. Gordon Luker on Tuesd
July 24th, at 4.15 P.M., in the Anatomical Theatre of
College.

LONDON SCHOOL OF TROPICAL MEDICINE.—A
result of examinations held at the end of this session
"Duncan" medal has been awarded to Dr. S. Peterson
the U.S. Navy. Those who passed the examinations w
distinction include Dr. A. H. Baldwin, Dr. F. McCall
Dr. S. Pampana, Dr. A. Salama, and 34 candidates satis
the examiners.

ROYAL SUSSEX COUNTY HOSPITAL. — Rec
developments at this hospital at Brighton include the
building for the orthopædic department, the money for wh
was largely given by the British Red Cross Society; the
by Lady George Nevill, in memory of her husband, L
George Nevill, who at one time was a member of the boar
management, of the whole of the equipment of her war-t
hospital at Hove; and the establishment, thanks to M
Poulter, of a school of massage at the hospital.

THE LUNATIC ASYLUMS IN BURMA.—The c
struction of a third asylum is projected to reli
the congestion at present experienced in one of the
existing buildings in Burma. There is evidence in
report that excellent facilities are provided for the empl
ment and entertainment of the patients. Alcohol
Cannabis indica appear to take a large share in the ætiol
of insanity in Burma; general paralysis is comparativ
rare. Many of the deaths were due to pulmonary tul
culosis. During an outbreak of plague in Rangoon all
patients in the asylum received protective inoculatio
No cases of the disease occurred in the asylum.

SMALL-POX PRECAUTIONS IN TERRITORIAL TRAINI
CAMPS.—A statement has been issued by the Ministry
Health to the effect that, in view of the prevalence
small-pox in certain parts of the country, he has been
communication with the Army Council in regard to
precautions in connexion with the annual training camps
the Territorial Army and Officers Training Corps.
units will be sent to camp from an infected district,
units raised in a non-infected district may be sent to cam
a non-infected district. All men will be examined by
army medical officer before proceeding to camp, and dur
the camping period any unvaccinated men will be kept un
observation.

FREE STATE COUNTY COUNCILS AND HEAL
REFORM.—At the annual meeting last week of the gen
council of county councils—a consultative body in wh
all the county councils in the Free State participate—
report of the standing committee on health matters
adopted. The report demands a series of legislat
reforms in regard to health; though a separate Minis
of Health is favoured, its immediate establishment is
pressed. It is suggested that a health council should
constituted representative of the medical and allied pro
sions, local health authorities, insured persons, labour a
other organisations concerned, and the Ministry of Edu
tion. It was considered that the minimum health u
should be the administrative county or county borou
The committee also recommended the repeal of the Medi
Charities Act, the extension of medical benefit to insu
persons and their dependents, and the provision of medi
treatment for those unable to pay for it. They recommen
the establishment of a medical service paid by the Sta
The committee also recommended that tuberculosis and
infectious and contagious diseases dangerous to hea
should be notifiable, and that the tuberculosis medi
officer should be empowered compulsorily to isolate pers
in cases where he considers isolation essential in the inter
of public health. Other recommendations included
effective inspection of cattle in respect of bovine tubercul
and the application of the tuberculin test to the milk-sup
It was further recommended that for every health area th
should be a medical officer of health, a veterinary offic
and that there should be provision for the effective inspect
of school-children. Almost all the recommendations of
Irish Public Health Council have been adopted.

Parliamentary Intelligence.

HOUSE OF COMMONS.

Wednesday, July 11th.

Cost of Pensions Patients.

r. **Albert Alexander** asked the Minister of Pensions t was the average cost per day of pensions patients at itals which were under the direct control of the Ministry ensions.—Major **Tryon** replied: The average is 8*s.* 2½*d.* patient.

Small-pox and Vaccination.

r. **Becker** asked the Minister of Health how many cases mall-pox had been notified this year; how many deaths occurred from small-pox this year; and was he satisfied all cases notified as small-pox were small-pox, or had cases so notified been found to be chicken-pox.—**Neville Chamberlain** replied: The number of cases mall-pox notified this year up to June 30th is 1225. No ths had been registered up to the end of last week as to small-pox, but I understand that a fatal case irred at Gloucester with an unvaccinated child on the inst. As regards the last part of the question, I am ised that, in small-pox as in other infectious diseases, rs in the initial diagnosis have occurred in some cases, the notification returns are corrected from time to time the omission of those cases which after notification have n found to be cases of chicken-pox, and the addition of s originally diagnosed as chicken-pox but subsequently d to be cases of small-pox.

Ir. **Broad** asked the Minister of Health if he would ply particulars of the cases of small-pox and deaths from t disease in the city of Mexico during each of the last years for which figures were available.—Mr. **Neville mberlain** replied: I have no information as to the nber of cases of small-pox in Mexico city. The following the particulars available in my department of the number leaths from that disease in the city during each of the rs 1913–1922: 1913, 326; 1914, 259; 1915, no figures ilable; 1916, 246 (10 months): 1917, 479; 1918, 140; 9, 12; 1920, 40; 1921, 429; 1922, 404 (10 months).

ieut.-Colonel **Fremantle** asked the Minister of Health e would consider the transference of the administration accination to the general sanitary administration under sanitary authorities.—Mr. **Neville Chamberlain** lied: This question has been under consideration, but I ld not undertake to introduce the necessary legislation ing the present session.

ir **George Berry** asked the Minister of Health if he was isfied with the manner in which the Vaccination Acts e being administered; and, if not, if he was prepared, view of the present serious epidemic of small-pox, to take ps to enforce rigid compliance with them.—Mr. **Neville amberlain** replied: The responsibility for the administra- of the Vaccination Acts rests with the boards of rdians and their vaccination officers. I am not satisfied t the Acts are being properly administered in all districts, I am considering what steps can be taken to secure provement in this respect.

Mr. **Bromfield** asked the Minister of Health whether organism of vaccinia had yet been isolated; and, if not, at guarantee could be given that it was present in any en sample of calf lymph issued by his department for blic vaccination purposes.—Mr. **Neville Chamberlain** lied: The answer to the first part of the question is in negative. As regards the second part, I am advised t the efficacy of the lymph issued from the Government aph establishment is adjudged by the usual laboratory ts for purity and its effect as reported by public vaccina- s. I may add that the Government lymph used during 22 for 284,000 cases of primary vaccination gave a per- tage success of 99·4.

Mr. **Leach** asked the Minister of Health if he would supply ticulars of the cases of small-pox and deaths from that ease in Rio de Janeiro during each of the last 10 years which the figures were available.—Mr. **Neville Chamber- n** replied: The following are the particulars required by hon. Member:—

ear.	Cases.	Deaths.	Year.	Cases.	Deaths.
13	625	118	1918	—*	222
14	5192	1230	1919	—*	305
15	826	258	1920	324†	99
16	449	121	1921	187†	49
17	1530	418	1922	327‡	117

* Figures not available.
† 4 weeks missing. ‡ 3 weeks missing.

Mr. **Bromfield** asked the Minister of Health whether the glycerinated calf lymph manufactured by the Government was tested on a certain number of children before being issued to the public vaccinators, with a view to ascertaining whether it was satisfactory; and, if so, whether the consent of the parents of the children was obtained before these experimental vaccinations were carried out.—Mr. **Neville Chamberlain** replied: The answer to the first part of the question is in the negative, and the second part, therefore, does not arise.

Brook Fever Hospital.

Sir **Kingsley Wood** asked the Minister of Health whether the Brook fever hospital at Shooters Hill was about to be permanently closed, and whether he could state the reason for this course.—Mr. **Neville Chamberlain** replied: The answer to the first part of the question is in the negative. I understand that, owing to the reduction in the number of cases of infectious disease in London, further admissions to this hospital are being stopped for the present, but the hospital will be reopened as soon as it is needed.

Medical Aid Departments.

Mr. **Clarry** asked the Minister of Health if he could see his way clear to framing regulations whereby a friendly society or group of societies might form medical aid departments for the purpose of supplying medicines and surgical appliances to their members.—Mr. **Neville Chamberlain** replied: The object which the hon. Member has in view cannot be secured without amending legislation which would be of a controversial character, and which I do not see my way to introduce. I have no power to deal with the matter by way of regulations.

Dirty Milk Vans.

Sir **Arthur Churchman** asked the Minister of Health whether his attention had been called to the lack of clean and well-ventilated milk vans on certain railway lines noted in paragraphs 42 and 43 of the interim report on milk issued by the departmental committee on the distribution and prices of agricultural produce; and whether his department proposed to take any action in the matter.—Mr. **Neville Chamberlain** replied: The answer to the first part of the question is in the affirmative. I propose to ask my right hon. friend, the Minister of Transport, to bring the recommendations of the departmental committee to the notice of the railway companies.

Panel Practitioners' Remuneration.

Sir **Kingsley Wood** asked the Minister of Health whether, in accordance with the pledge given by his predecessor, he proposed to consult both the Consultative Council and representatives of the approved societies before any new terms as to remuneration and service were arranged with the medical men on the panel lists; whether he proposed to arrange such consultation before any offer as to remuneration was made; and when, and in what manner, he proposed any consultation should take place.—Mr. **Neville Chamberlain** replied: As regards the first two parts of the question, I would refer the hon. Member to the answer which I gave him on April 11th. As regards the third part, the matter is now under consideration, and I am not yet in a position to make any statement.

Discharge of Private Lunacy Patients.

Mr. **Hayday** asked the Minister of Health by what authority the London County Council, through their asylum regulations, had interfered with the right guaranteed to a petitioner by Section 72 of the Lunacy Act, 1890, to direct the discharge or transfer of a private patient from a pauper asylum by exacting four weeks' payment if the patient was taken away, whereas in institutions for rich patients the provisions of Section 72 were punctiliously carried out and the patient was allowed to leave at once on the legal direction given by his petitioners; and would he see that this practice was stopped.—Mr. **Neville Chamberlain** replied: Inquiry is being made by the Board of Control and I will communicate the result to the hon. Member.

Deaths from Tuberculosis.

Mr. **Murnin** asked the Minister of Health the number of persons who died in England and Wales during the years 1921–22 from tuberculosis.—Mr. **Neville Chamberlain** replied: The number of deaths from tuberculosis in England and Wales during the year 1921 was 42,678, and during the year 1922 42,777.

Cheese, Milk, and Cream Standards.

Mr. **Hurd** asked the Minister of Health the result of his consultation with the Minister of Agriculture with a view to the adoption of the recommendations of the departmental committee for the imposition of a legal minimum standard of quality applicable to whole-milk cheese, cream, and milk powder.—Mr. **Neville Chamberlain** replied: I understand that my right hon. friend is examining the situation with a view to determining whether it is practicable to give effect to the recommendations of the departmental committee in regard to whole-milk cheese and cream.

Thursday, July 12th.

Medical War Records.

Mr. **Ede** asked the Minister of Pensions what progress had been made with the preparation of the medical records of the war, what sum had been expended on these records up to June 30th, 1923; when it was anticipated that the record would be completed; and what would be the total cost of the same.—Major **Tryon** replied: I assume that the hon. Member is referring to the records of admissions to and discharges from ambulances, hospitals, or clearing stations during service. These medical records have now been sorted and indexed in one register, but as the work was commenced by the War Office and completed by the Statistical Division of my department as part of their general duties, I regret I am not in a position to state the cost without very considerable investigation.

Treatment for War Neurosis.

Mr. **Robert Richardson** asked the Minister of Pensions what was the total number of pensioners receiving treatment for war neurosis and other shell-shock conditions, and whether he was satisfied with the provision made in the different regions for the treatment of pensioners suffering from shell-shock and/or neurasthenia.—Major **Tryon** replied: The number of patients at present receiving treatment under my department for war neurosis is about 6900. The whole question of the treatment of this very difficult condition is kept constantly under review by my medical advisers. Full provision is made for the most modern treatment. I am glad to say that our accommodation is ample and we have no waiting list.

Final Pension Appeals in 1921.

Mr. **Whiteley** asked the Minister of Pensions what number of cases were dealt with before the final tribunals in 1921 and 1922 for entitlement and assessment, respectively, and the number of successful cases in each year.—Major **Tryon** replied: The number of appeals on entitlement decided by the tribunal during 1921 was 43,750, of which 11,500 were allowed. The comparative figures for 1922 are 37,350 and 9,980. The assessment tribunals, which did not commence work until June, 1922, decided 13,023 appeals up to the end of that year. Of these the assessment was increased in 2500 cases and lowered in 23. The final award was set aside in 2500 cases and the appeal disallowed in 8000 cases.

Institutional Treatment of Tuberculosis.

Mr. **Trevelyan Thomson** asked the Minister of Health whether he approved of the charge made to tuberculous persons in the London area in respect of institutional treatment; and, if so, why, in this respect, had the institutional treatment of tuberculous persons been differentiated from that of the other infectious diseases.—Lord E. **Percy** replied: My department have approved generally of the arrangement made by the L.C.C. for the assessment of contributions payable by tuberculous persons towards the cost of institutional treatment provided by the Council. As regards the second part of the question, the statutes under which institutional treatment is provided in London for persons suffering from other infectious diseases do not authorise the recovery of any part of the cost of treatment from the patient.

Wounds on Executed Prisoner.

Mr. **Lansbury** asked the Secretary of State for the Home Department whether his attention had been called to the fact that at the inquest held on Roland Duck, after his execution at Pentonville prison last week, a severe wound was found on his head and a considerable quantity of congealed blood was attached to his hair; whether the coroner had made a report to him as to how this injury was sustained; and whether the man's father and mother, who attended the inquest, had asked the Home Office to order an inquiry as to the cause of this injury.—Mr. **Bridgeman** replied: Reports received from the prison showed that when the body was taken down there was no mark on the head, but when the body was being washed, after removal to the mortuary and post-mortem examination of the neck by the medical officer, a bruise was noticed on the forehead. The body had slipped while being placed on the mortuary table and the head had struck a slab. The medical officer called the coroner's attention to the bruise. The coroner's inquisition was sent to me. He made no report, but I have now seen his notes, which show that the jury was satisfied that the bruise was caused after the execution. Before the inquest ended the father said he was satisfied, but both parents have written since expressing dissatisfaction. They will be informed that I find no ground for further inquiry.

Infection in Public Libraries.

Colonel **Morden** asked the Minister of Health whether attention had been directed to the danger of infection the frequenters of public libraries through the use of bo previously handled by persons suffering from infecti ailments; and whether he would take steps to investig this menace to the public health by directing local authorit to use adequate disinfectants in the public libraries of t country.—Lord E. **Percy** replied: The answer to the fi part of the question is in the affirmative, but my right h friend is advised that medical officers of health are fu alive to whatever danger of infection there may be from t source. Special provisions as to the precautions to be ta to prevent the spread of infection through the use of libr books are contained in Section 59 of the Public Health A Amendment Act, 1907, and that section may be put in fo in any district on the application of the local authority. the circumstances the Minister does not consider it necess to undertake any special investigation or to issue any spe instructions to local authorities on this matter.

Fifty per Cent. Pension Awards.

Mr. **Herriotts** asked the Minister of Pensions the num of pensioners in receipt of a pension of 50 per cent. or o on March 31st, 1919, and the number of pensioners in rece of a pension of 50 per cent. or over on March 31st, 1923, loss of vision, for loss of limbs, for loss of hearing, for gunsh wounds, for tuberculosis, and for diseases other than tub culosis respectively.—Major **Tryon** replied: The ans to the first part of the question is 252,000. In March, 19 approximately 160,800 awards of 50 per cent. or over w in payment as follows: Eye disabilities 6600, injury limbs (including amputations) 58,000, other wounds injuries 22,800, ear disabilities 2800, tuberculosis 30,300, ot diseases 40,300.

Small-pox and Vaccination.

Mr. **Trevelyan Thomson** asked the Minister of Hea the particulars which indicated that the percentage of ca of small-pox had increased with the reduction in the num of vaccinations which had fallen from 85·6 of births 1872–81 to 43·4 in 1912–21.—Lord E. **Percy** replied: my right hon. friend informed the hon. Member on t 4th inst., particulars as to the total number of cases of sma pox in England and Wales are not available for any ye prior to 1911, and it is not, therefore, possible to give t desired information for the periods mentioned in the questi The number of cases of small-pox during each of the ye 1911 to 1922, and the percentage of vaccination to birt in each of those years, are given in the following table :–

Year.	Cases of small-pox.	Percentage of vaccination to births.	Year.	Cases of small-pox.	Percentage vaccinatio to births.
1911	289	52·3	1917	7	42·3
1912	121	50·1	1918	63	41·5
1913	113	46·5	1919	311	40·6
1914	65	44·6	1920	280	39·5
1915	93	45·5	1921	336	38·3
1916	159	44·7	1922	973	—*

* Not yet available.

White Lead Convention.

On a vote of £185,969 for the salaries and expenses of t Home Office,

Mr. A. **Greenwood** moved to reduce the vote by £1 He said there were far too many cases of lead poisoning the present time, and he attributed that to the ineffecti administration of the regulations by the Home Office. T whole industry was united, and there was no real reas which should debar the Home Secretary from enforcing the Cabinet the importance of an early ratification of t White Lead Convention.

Mr. **Turner** seconded.

Mr. G. **Locker-Lampson** (Under-Secretary for the Ho Department) said the question of ratifying the White Le Convention agreed upon at Geneva was not quite so easy some people might think. The Minister of Labour who w at Geneva agreed to the terms of the agreement, b unfortunately since that date a certain misunderstanding h arisen about one of the principal agreements under t Convention—the employment of young persons und 18 and the employment of women for industrial purpos Apparently a good many members at Geneva were under t impression that that article referred only to the painting houses. Other members declared that it referred to t whole of industrial painting. Until that point had be cleared up satisfactorily it was rather difficult for th country to agree to the ratification of the Conventio He hoped, however, the delay would not be very long. Sin the Geneva Convention sat a new process had been introdu

olving the use of wet sand-paper, by means of which the old
gers arising out of dry rubbing down could be prevented.
thought it was absolutely essential that further experi-
ıts should be made with this new material before a
ınite decision was come to. The Home Office was at
sent receiving deputations on the subject.

Workmen's Compensation.

ſr. G. **Spencer** asked whether the Home Secretary would
oint another medical referee under the Workmen's
npensation Act for the County of Nottingham for
ling with certain industrial diseases. At the present
e cases had to be sent to Sheffield, and the men affected
l to pay their expenses to Sheffield to be examined in
es in which the certificate given by the certifying surgeon
s questioned by a colliery company. He was sorry
say that the workmen in the county of Nottingham had
faith in the present medical referee, not because they
ged he was unfair, or that he acted in an *ex parte* manner,
because they believed that he was not conducting cases
sistently with the description of the disease in the Act.
belonged to the school of medical opinion which held that
bjective symptoms were not present, then the disease did
exist.

Mr. **Locker-Lampson** said that the point raised by Mr.
encer was an important one, and the Home Office would
sider it.

The motion to reduce the vote was negatived and the vote
s agreed to.

FRIDAY, JULY 13TH.

Sale of Liquor to Children.

On the motion for the third reading of the Intoxicating
quor (Sale to Persons under 18) Bill,

Sir F. **Banbury** moved the rejection of the measure.
said he wished to call the attention of Viscountess **Astor**
l a number of those who supported the Bill to a speech
de by Sir S. Russell-Wells only a few days previously,
which he said that beer was a food and contained a certain
antity of nourishment, and also that tea was a pure drug.
erefore the supporters of the Bill were endeavouring to
event young people from getting what a medical authority
lared to be nourishment and to make them take instead
nething which was after all merely a drug.

Viscountess **Astor** thanked the Government for having
en facilities to the Bill.

The Bill was read a third time by 257 votes to 10.

Small-pox and Vaccination.

Lieut.-Colonel **Arthur Murray** asked the Minister of
alth whether he could state how many of the 408 persons
ted as suffering from small-pox for the four weeks ended
ne 30th were vaccinated at birth and/or were vaccinated
a later period.—Mr. **Chamberlain** replied: Information
to the vaccinal condition of these persons is at present
ailable in only 227 of the cases. This information is
en in the following statement, but the particulars are
bject to revision in the light of further information which
y subsequently be received:—

	Vaccinated in infancy.	Vaccinated later.		Revaccinated.	Stated to have been vaccinated but showing no cicatrix of vaccination.
		After infancy and before exposure to infection.	After exposure to infection.		
8	31*	1	3	2	2

* Including 2 suspected cases.

Institutional Treatment of Tuberculosis in Leicester.

Major **Guy Paget** asked the Minister of Health whether
was aware that the cases for Government treatment for
berculosis were limited in Leicester to 30; and, seeing
at, in view of the fact that every insured person con-
buted to this treatment, this was an insufficient number,
d that in consequence the voluntary institution was over-
owded with surgical tuberculous cases which largely
mpered its other work, would he inquire into the matter.
Mr. **Neville Chamberlain** replied: The answer to the
st part of the question is in the negative. On July 1st
e number of persons receiving institutional treatment for
berculosis from the Leicester Town Council was 217. I
ı not aware of the actual number of cases of surgical
berculosis included in this figure, but the provision made
local authorities for the treatment of this disease would
turally have the effect of relieving the pressure upon
luntary institutions. In the circumstances I see no
cessity for any special inquiry, and I may point out that
e health insurance contributions payable by insured
rsons do not now include any payment towards the cost
institutional treatment for tuberculosis.

MONDAY, JULY 16TH.

Child Mortality.

Mr. **William Thorne** asked the Minister of Health the number of children who died before the age of 12 months in the London County Council area, Glasgow, West Ham, and Stoke-on-Trent during the year ending March, 1922.—Lord E. **Percy** replied: The figures asked for in the question as regards London are 8334; Glasgow, 3644; West Ham, 705; and Stoke-on-Trent, 978. The corresponding infant death-rates per 1000 births for London, West Ham, and Stoke-on-Trent were 82, 83 and 138 respectively.

Insulin Treatment.

Sir **Walter de Frece** asked the Minister of Health what steps were being taken to bring the insulin treatment within the reach of the very poor.—Lord E. **Percy** replied: It is within the powers of guardians, on the advice of the medical officer, to pay for the supply of insulin in cases of destitution.

Pensions Administration in the North of England.

Mr. **Potts** asked the Minister of Pensions whether the Yorkshire regional headquarters of the Ministry of Pensions were to be transferred to Newcastle; whether he would state the population in the present Yorkshire area and the population in the northern area which was at present administered from Newcastle; whether the population in the Yorkshire area was approximately nearly double that of the northern; and, if it was eventually intended to administer the entire North of England from one centre, would he consider whether Leeds would offer a balance of advantages.—Captain **Craig** replied: The answer to the first part of the question is in the affirmative; to the second and third parts, that the population of the Yorkshire and northern regions, according to the census of 1921, is 3,917,713 and 2,754,187 respectively; and to the last part that it is not in contemplation to administer the entire north of England from one centre.

Child Adoption.

Mr. **Gerald Hurst** asked the Secretary of State for the Home Department whether he had considered the Report on child adoption made by the committee appointed to make such Report by the Home Office and the two Bills which had been introduced to give effect to its recommendations; and if he could hold out any hopes of the Government bringing in or giving facilities to any Bill for this purpose.—Mr. **Bridgeman** replied: Yes, Sir. I am afraid the Government cannot undertake to introduce legislation on this subject at the present time, and the pressure of Parliamentary business makes it impossible to give special facilities to a private Member's Bill.

Infantile Mortality.

Captain **Bowyer** asked the Minister of Health whether he would give the most recent figures showing the death-rate per 1000 of legitimate and illegitimate infant children, respectively; and would he say how these figures compared with those of ten years ago.—Mr. **Neville Chamberlain** replied: The most recent figures are those for 1922, in which year the infant death-rate per 1000 children born was 74 in the case of legitimate children and 139 in the case of illegitimate children. The corresponding figures for the year 1912 were 91 and 181 respectively.

Dentists Bill.

The Dentists Bill was read a third time. (The object of this measure is to give ex-Service studentsf or the dental profession extra time to qualify under the provisions of the 1921 Act.)

TUESDAY, JULY 17TH.

Visiting Committees in Mental Hospitals.

Mr. **William Albert Jenkins** asked the Minister of Health if he was aware that at present Poor-law guardians have not the right of full representation upon the visiting committees of mental hospitals; and would he take steps to make provision for this right in the Bill about to come before Parliament.—Lord E. **Percy** replied: The answer to the first part of the question is in the affirmative, and I doubt if it is desirable to alter the existing law in the direction suggested.

DONATIONS AND BEQUESTS.—Mr. Thomas Henry Chadwick, mill manager at Oldham, bequeathed over £100,000 in charities, including £9000 to the Oldham Royal Infirmary to endow nine Thomas Henry Chadwick beds, and £1000 life-policy to the same institution; £1000 each to the Deaf and Dumb Institution, Oldham, the Oldham Nursing Association, and the British Red Cross Society; £500 each to the Workshops for the Blind, Oldham, the National League of the Blind, Dr. Barnardo's Homes, and St. Dunstan's Hostel; the residue—apart from other bequests—to establish almshouses for aged or infirm persons over 60 years of age resident in Oldham for 25 years and members of the Church of England.

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith-road, W.

MONDAY, July 23rd.—10 A.M., Mr. Maingot: Surgical Pathology. 2 P.M., Mr. Addison: Surgical Wards. 3 P.M., Mr. Simson: Diseases of Women.

TUESDAY.—10 A.M., Mr. Steadman: Dental Dept. 12 noon, Dr. Burrell: Chest Cases. 2 P.M., Mr. Sinclair: Surgical Out-patients.

WEDNESDAY.—10 A.M., Dr. Saunders: Medical Diseases of Children. 11 A.M., Mr. Simson: Gynæcological Demonstration. 2 P.M., Dr. Burnford: Medical Wards.

THURSDAY.—10 A.M., Dr. Grainger Stewart: Neurological Dept. 2 P.M., Mr. MacDonald: Genito-Urinary Dept. 3 P.M., Dr. Scott Pinchin: Medical Out-patients.

FRIDAY.—11 A.M., Dr. McDougal: Electrical Dept. 12 noon, Mr. Endean: Venereal Diseases. 2 P.M., Mr. Banks-Davis: Throat, Nose, and Ear Dept.

SATURDAY.—9.30 A.M., Dr. Burnford: Bacterial Therapy. 10 A.M., Dr. Saunders: Medical Diseases of Children. 10 A.M., Mr. Banks-Davis: Operations on Throat, Nose, and Ear.

Daily, 10 A.M. to 6 P.M., Saturdays, 10 A.M. to 1 P.M., In-patients, Out-patients, Operations, Special Departments.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.

Demonstration of Clinical Cases at 3.30 P.M.

MONDAY, July 23rd.—Dr. J. Browning Alexander: Medical.
TUESDAY.—(3 P.M.) Mr. Howell Evans: Surgical.
WEDNESDAY.—Mr. Norman B. B. Fleming: Eye Cases.
THURSDAY.—Mr. H. W. Carson: Surgical.
FRIDAY.—Dr. C. E. Sundell: Diseases of Children.

Appointments.

ANDERSON, J. B., M.B., Ch.B Aberd., has been appointed District Medical Officer and Public Vaccinator for Bishopwearmouth, West District.

DAVIDSON, G. S., M.B. Aberd., F.R.C.S. Edin., to be Extra Physician (Honorary) to the Aberdeen Maternity Hospital, with special charge of the Out-patient Department.

DAVIES, J. C., M.B., B.Ch. Oxf., Certifying Surgeon under the Factory and Workshop Acts for the Chipping Campden District of the County of Gloucester.

GUEST, D., M.B., Ch.B., Assistant Bacteriologist, University of Sheffield.

LAMONT, D. C., M.B. Edin., D.P.H., Assistant Medical Officer of Health and Tuberculosis Officer; and **FRAZER, W. M.**, M.Sc., M.B., Ch.B. Liverp., Assistant Medical Officer of Health and Assistant School Medical Officer at Blackburn.

M'KENDRICK, W., M.D. Glasg., D.P.H., Medical Officer of Health for Hartlepool.

M'KINNEY, J. W., M.B., Ch.B. Edin., D.P.H. Dub., Medical Officer of Health to the Ballymoney Urban District Council.

Queen Charlotte's Lying-in Hospital: **CUTHBERT, J. R.**, M.B., Ch.B. Otago, N.Z., and **HALL, N. B.**, M.B., B.S. Adelaide, Assistant Resident Medical Officers.

Vacancies.

For further information refer to the advertisement columns.

Canterbury, Kent and Canterbury Hospital.—Res. M.O. £175.
Cheshire Joint Sanatorium, Loggerheads.—A.M.O. £350.
Chesterfield and North Derbyshire Royal Hospital.—Jun. H.S., Cas. O. and Orthopædic H.S. £175 and £170 respectively.
Dreadnought Hospital, Greenwich, S.E.—H.P. £150.
Durham County Hospital.—H.S. £200.
Earlswood, Royal Earlswood Institution.—Med. Supt. £800.
East African Medical Service.—M.O. £600.
East London Hospital for Children.—H.P. £125.
Glasgow University.—Chair of Public Health.
Hemel Hempstead, West Herts Hospital.—Res. M.O. £200.
King's College Hospital, Denmark Hill, S.E.—Jun. Anæst.
King's Lynn, West Norfolk Hospital.—Asst. Res. M.O. £100.
Leeds Public Dispensary.—Sen. Res. M.O. £200.
Liverpool, West Derby Union.—Asst. Res. M.O. £300.
London Hospital, E.—Second Registrar to Ear, Throat and Nose Dept. Also First Asst. to each of the Surgical Firms. £400.
Manchester, Baguley Sanatorium.—Third Asst. M.O. £400.
Manchester Royal Eye Hospital.—Jun. H.S. £120.
Manchester Royal Infirmary.—Asst. Res. M.O. £100.
Manchester, Victoria Memorial Jewish Hospital.—Hon. S.
Metropolitan Ear, Nose, and Throat Hospital, Fitzroy-square, W.—Non-Res. H.S. £150.
Mid-Wales Counties Mental Hospital, Talgarth, Breconshire.—Med. Supt. £800.
Middleton-in-Wharfedale Sanatorium, Ilkley.—Res. A.M.O. £325.
National Hospital for Diseases of the Heart, Westmoreland-street, W.—Res. M.O. £150.
Northampton County Mental Hospital.—Locum. £8 8s. week
Nottingham Children's Hospital.—Res. H.S. £150.
Rotherham Hospital.—Jun. H.S. £150.
Royal Naval Medical Service.—Surgeon-Lieutenants.
Royal Waterloo Hospital for Children and Women, Waterloo-ro S.E.—Cas. O. £150.
St. Andrews University Medical School, Dundee.—Chair Medicine.
St. Bartholomew's Medical College.—Demonstrator of Physiolog
Salvation Army Mothers' Hospital, Clapton.—Sen. Res. Me Woman.
Tiverton Hospital, Devon.—H.S. £100.
West African Medical Service.—M.O. £660.
Windermere, Ethel Hedley Hospital for Crippled Children.—H. £150.

The Chief Inspector of Factories, Home Office, London, S.W announces the following vacant appointment: St. Ju (Cornwall).

Births, Marriages, and Deaths

BIRTHS.

ALLCHIN.—On July 9th, at "The Briars, Northwick Park-roa Harrow, the wife of F. M. Allchin, M.B. Lond., of a son.

FIRTH.—On July 13th, at Manchester-square, W., the wife Douglas Firth, M.D., of a daughter.

HOLMES.—On July 14th, at 29, Manley-road, Whalley Rang Manchester, to Dr. and Mrs. A. Hillyard Holmes, a daught

MOORHEAD.—On July 12th, at Little Squerryes, Westerha the wife of R. Leishman Moorhead, M.B., C.M., of a daught

MARRIAGES.

BLOCKLEY—MYERS.—On July 10th, at St. John's Churc Torquay, John P. Blockley, F.R.C.S. Edin., to Effie, wid of James Nutter Myers.

EDEY—EWALD.—On July 9th, at Christ Church, Ramsgat Thomas Hugh Edey, M.R.C.S., L.R.C.P., to Gladys Ya borough, younger daughter of the late Henry B. Ewa and Mrs. Ewald, of Nelson-crescent, Ramsgate.

DEATHS.

CODNER.—On July 12th, at Woodside, Corfe, near Taunto John Codner, M.B., C.M. Edin.

PARE.—On July 13th, John William Pare, M.D., L.D.S. Eng F.R.S. Edin., aged 62.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices Births, Marriages, and Deaths.

THE LANCET: SUBSCRIPTION RATES.

		£	s.	d.
INLAND	One Year	£2	2	0
	Six Months	1	1	0
	Three Months	0	10	6
ABROAD	One Year	2	10	0
	Six Months	1	5	0
	Three Months	0	12	6

ROYAL SANITARY INSTITUTE.—The thirty-fourt congress will take place at Hull from July 30th to August 4t under the presidency of the Rt. Hon. T. R. Ferens, J.P High Steward of Hull. The inaugural meeting will held at the Royal Institution, Albion-street, on July 30 at 5 P.M. Sections will be devoted to sanitary scienc personal and domestic hygiene, engineering and architectur and maternity and child welfare (including school hygiene There will be conferences of the following public healt workers: representatives of sanitary authorities, enginee and surveyors, health visitors, port sanitary authoritie veterinary inspectors, and medical officers of health. Th meetings of sections and conferences will be held in t School of Art, Anlaby-road, and in the Guildhall. O July 31st, at 8 P.M., Sir Alexander Houston will lecture "A Pure Water Supply," and on August 2nd, at 8 P.M Mr. B. Seebohm Rowntree will lecture on "Industry an National Welfare."

An exhibition of apparatus and appliances relating health and of domestic use will be held, in connexion wit the congress, at the Wenlock Barracks, Anlaby-roa Fellows, members, and associates of the Institute are supplie with tickets (£1 11s. 6d. each) on application to the Secretar before the congress, at the offices of the Institute, 9 Buckingham Palace-road, S.W. 1. Tickets for those n connected with the Institute will be issued up to July 27t at the offices of the Institute, or at the offices of the loc treasurer at the City Treasurer's Office, Guildhall, Hul and on the following days at the Reception Room in th School of Art. Ladies' tickets (not including copies of th proceedings) 10s. 6d. each. Lists of hotel and boardin house accommodation may be obtained on application to th secretaries.

otes, Comments, and Abstracts.

TYPHUS FEVER EPIDEMIC AMONG THE GREEK REFUGEES.

Y SIR PATRICK HEHIR, K.C.I.E., C.B., C.M.G.,
M.D. BRUX., F.R.C.S., F.R.C.P. EDIN.,
AJOR-GENERAL, I.M.S. (RET.): MEDICAL ADVISER, BRITISH
RED CROSS SOCIETY IN GREECE.

T has fallen to my lot to see a great deal of typhus
ong the Greek refugees during the last four and a half
nths. As the outbreak presents many points of difference,
lemiologically and otherwise, from the disease as ordinarily
with elsewhere, an account of it may be of interest. The
ek refugees primarily brought the infection with them,
have been moving from one place to another carrying
disease, either in the incubating stage or in a mild ambu-
ory form. The serious cases are, of course, incapable of
vement with the masses.

Epidemiology.

he epidemiological history of the present outbreak is
ily understood if one pictures the conditions, economic,
itical, and military, that have been in existence in relation
these refugees since last autumn. Apparently there is a
dual rise in the intensity of the epidemic until it reaches
acme; this continues for a few months and then the
lemic gradually subsides. There are, however, oscilla-
ns in the intensity which, I believe, are mainly associated
h variations in meteorological conditions, but doubtless
er accidental factors are concerned. With us it began at
end of January, gradually rose in numbers and severity
attacks, reached a maximum about the first fortnight in
rch, remained stationary for a month or so, and is now
lergoing a marked abatement.

t is noteworthy that in areas where refugees have been
lely dispersed on the land there has been no typhus, or
as not become epidemic when introduced. Other things
ng equal, the intensity of the epidemic appears to depend
gely upon the economic conditions in existence. The
ation of typhus to overcrowding, long misunderstood, is
v known to be easily explained by the part that human
play in the disease. The brunt of the epidemic has been
ne by the larger towns—e.g., Athens and its environs,
onica, Patras, Corfu—the smaller towns escaping to a
siderable extent, the incidence being related to the
sity of population on the occupied area. Whole rural
tricts in Macedonia and Western Thrace have escaped
ogether. The housing conditions of the refugees, their
dships—especially insufficient food and exposure—have
siderably lowered their resistance to disease, which, except
the case of minor maladies, runs a serious course and is
quently fatal. This high mortality is important, as it has
used antipathy to the hospitals; early cases of sickness
hidden, and often hospital relief is only sought when the
tient is dangerously ill, this being one of the ways in which
hus is being spread.

The outbreak attained its maximum of intensity in mid-
nter. In colder weather the people are more crowded
gether; they wear thicker clothes, which foster lice, and
the less frequently. Throughout the winter refugees were
cked with the ordinary civil population in the waiting
oms of railway stations and in other places; contact cases
re therefore more frequent. As I write this in the British
d Cross train at Salonica railway station, a refugee-train
in a siding; in and around the station yard are, roughly,
0 refugees, all on the way to Seres (Thrace) to take up
rk on the land. The same sort of arrivals and distribu-
ns are occurring in many large railway stations; it is easy
see how communicable disease spreads rapidly among
em, and also reaches the stationary populations of towns.

Overcrowding is, however, only one of the factors that enter
o the epidemiology of typhus. Other hardships exist: A
ry large percentage of the refugees get only a bare subsis-
nce allowance of food. In some districts men who can
rk get no food dole, and out-of-work women get only
o 8 ounces of bread or flour a day. Until a few months ago
v refugees had a change of clothing; undergarments were
pecially scarce. A great deal of help has been given them
w in this respect, and I know of no camp of any duration
at has not been relieved. With only one suit of clothes
e practical difficulties of delousing are obvious; the suit
put through the steam disinfector and dried while the
fugee is having his bath. The sanitary condition under
hich refugees lived for months after their return to Greece
as indescribably bad; it has, in the last two months or so,
en greatly ameliorated.

It is superfluous to state that the infected human louse is the intermediary in the transmission of typhus; ordinarily there is no direct communication of the disease from man to man. If it were possible to exterminate human lice in an infected area the disease would cease. All our radical preventive measures are based on this knowledge. Experienced local medical administrators act on the principle that if there are no lice on the people themselves and their clothes they cannot give the disease to others. Somehow it has got abroad that it is only the body-louse that acts as a carrier. I am all but morally certain that this is not the case, and that the exculpation of *P. capitis* is a dangerous theory.

The micro-organism of typhus passes through a developmental stage in the louse; in that insect it is intracellular, develops, is set free, and is finally discharged into the oral apparatus, from which it is introduced into man. In man it again becomes intracellular, and from the infected cells it is thrown into the blood with its toxins. The louse does not transmit the virus until four days have elapsed from the time of its infection; infection of man is in the vast majority of cases through the bite of the louse, and the insect's excreta rubbed into scratches of the skin is also believed to give rise to infection in a small number of cases. So far as I can discover, no original work is being done during this epidemic in regard to the relation of the louse to typhus.

The infectious diseases hospitals for typhus cases in refugees are not ideal institutions, but they might be worse. There is usually a sufficient number of sick attendants, nurses, and doctors, but want of experience as to how to deal with the disease has been evident in several local epidemics. The arrangements for protecting the hospital staff from infected lice was one of the most serious defects I came across. When I visited an infectious diseases hospital some weeks ago a long white coat was given me to wear in the wards. After I had put it on one of the hospital orderlies picked off a louse from the neck, remarking that it was seldom he found one on the assistant director's gown which I was wearing. In one infectious diseases hospital the arrangements for delousing patients admitted were of the most elementary kind, except that a steam-disinfector was occasionally used for the clothing when water was available. There was no bathing of patients on admission, but the hair was cut short. I found that the sanitary arrangements in wards and latrines called for serious improvement—some of the wards were offensive, as several cases of incontinence of urine and fæces were present and the nursing and cleanliness were unsatisfactory. In our own camp one day I found that three cases which the Greek medical officer (himself a refugee) had diagnosed as "fever" had been allowed to remain in the main blocks. All three had lice on their clothes; they were all cases of typhus and two of them already had the rash. In one town a severe epidemic of influenza was reported to exist, but the high mortality aroused suspicion and inquiries by experts were made; it was found that influenza was the minor disease and typhus the real epidemic. The same history was given me by the controlling medical authority in regard to two other towns. As the result of this want of experience several doctors and nurses taking no precautions got the disease and died. It is all but morally certain that anyone attending typhus cases without a knowledge of the nature of the disease will become infected himself sooner or later. It is important to educate the subordinate staff of these hospitals in the ætiology of typhus and the principles adopted in the prevention of infection.

(*To be continued.*)

MEDICAL WORK OF THE MISSION TO LEPERS.

THE forty-eighth annual report of the Mission to Lepers,[1] presented at the annual general meeting of members of the mission at the Central Hall, Westminster, on May 10th, contains a chapter devoted to the medical work of the mission, in which short statements by various medical men and women are quoted. The mission cares for 7735 leper inmates in its own and aided institutions, and also for over 600 untainted children, who are educated and trained in separate homes to become useful members of the healthy community. At Dichpalli, near Nizamabad, Deccan, India, improved results have been obtained by intravenous injection of the ethyl esters of chaulmoogra or hydnocarpus oils, as opposed to intramuscular injection. "This means that very much more of the drug is administered, with consequent signs of improvement. In nodular cases an auto-vaccine is prepared for each patient." In some cases the two methods are combined. The conditions of unrest in China militate against the handling of the leper problem: "In Siao Kan (Central China), since the middle of the war period, we have only encouraged the more pronounced, or chronic, cases to come into residence. This means that we have turned away the very cases which the treatment would have best served, for undeniably the esters act most rapidly in the early stages of the disease." From the Fusan Leper Asylum, Korea, the honorary superintendent writes : " Before we began the chaulmoogra oil treatment our death-rate was always as high as 25 per cent. The inmates had little or no hope of a cure ; . . . . it was with the greatest difficulty that they could be got to do any kind of work. Now, with the exception of those who are maimed or blind. . . . they form a hive of industry and are as happy a crowd as one can see anywhere. We have already discharged nine cases in which no trace of the disease could be found ; and there are, perhaps, double that number who have no active symptoms though they still have some anæsthetic patches. . . . In the first year of the treatment the death-rate was reduced from 25 to 15 per cent., though only about half the patients were given the injections. Since then the percentage in successive years came down to 9, 6, 6, 5, 4, and for the past year it stands at $2\frac{1}{2}$ per cent. ; but as half the deaths resulted from an epidemic of typhoid, it may be said that the death-rate from normal causes was only $1\frac{1}{4}$ per cent. This is specially remarkable when it is remembered that only cases far on in the disease have been admitted for several years. These results are from Dr. Wilson's method of intramuscular injections of whole chaulmoogra oil, camphorated. The new Dean treatment with ethyl esters of chaulmoogra oil gives promise of still better results." In a short article appended to the report Dr. E. Muir, leprosy research worker in the School of Tropical Medicine, Calcutta, states that the most hopeful feature in connexion with leprosy in India is the increasing interest being taken in the problem by the medical profession and the public alike. The leper beggars in the streets have, he remarks, generally reached a stage at which the lepra bacillus has died out of the system ; although there is danger from this source, the chief danger is from those who mix in various grades of society, from the highest downward, who are either unaware of, or are concealing, the fact that they are disseminating the disease. Dr. Muir has " come across cooks and house-servants, schoolboys attending school, students attending college, teachers of both sexes instructing the young, confectioners serving over the counter, and men and women in other walks of life, all in a position to spread the disease to those around them."

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[1] "A Fruitful Field." Mission to Lepers, 33, Henrietta-street, Covent Garden, London, W.C. 2. 6*d*.

A NEW GAS-MASK.

CONSIDERABLE study has been devoted since the war to gas warfare in the United States, and the Bureau of Mines of Pittsburg in Pennsylvania has in consequence developed a " universal gas-mask,"[1] which, with its harness, weighs $8\frac{1}{2}$ lb., and protects, though for a short time only, against small doses of most noxious gases. It produces no oxygen, so cannot serve as a protection in atmospheres deprived of oxygen, and no atmosphere which extinguishes a candle can be entered with reliance on this mask ; a self-contained oxygen-breathing apparatus must then be used. In this " universal gas-mask " the entering air first passes through (*a*) an activated charcoal, to remove organic vapours, then through (*b*) a filter of cotton-wool to remove smokes, dusts, and mists ; next comes (*c*) caustic soda, fused on pumice stone, to remove acid gases. These are followed by (*d*) another cotton-wool filter ; (*e*) fused calcium chloride, to extract water vapour which would inhibit the action of the next absorbent ; (*f*) " hopcalite," a mixture of oxides of manganese and copper, with sometimes silver and cobalt, to destroy carbon monoxide ; and finally (*g*) silica gel for absorbing ammonia. This mask is considered to be safe for six hours of use. It has been used for 14 hours, but not without great risk, for when carbonic oxide absorption is completed and that gas is coming through no warning is given. How thirsty the wearer must have been after inspiring air all that time through fused calcium chloride, and in the dry atmosphere of the United States, too! A smaller equipment for firemen weighs $5\frac{1}{2}$ lb., and gives protection for four hours.

THE TRAINED CLIMBER.

MANY medical men know the value of Swiss mountain air for holidays after heavy work ; some make a point of spending a month every year there. For the strenuous mountain-climbing is an attraction, and it is of interest to learn that for the timid amateur who dreads being a drag on other climbers a scientific course of instruction, theoretical and practical, in mountaineering will be given at the end of July in the beautiful village of Klosters, in the Grisons district, at a fee of £6 6*s*., including board. Full particulars may be had from Gustav Walty, Klosters.

Of importance in this connexion is an article on Muscular Exercise by Prof. A. V. Hill, F.R.S., in *Nature* of July 14th, in which recent work on muscle contraction and recovery is summarised, leading to the modern view that man's po
of taking exercise, whether violent or prolonged, depe
largely on his ability to run into debt for oxygen.
prolonged effort, such as that associated with climbi
the healthy man is limited not by the magnitude of " deb
into which his body can run—not, that is to say, by
lactic acid maximum of his muscles—but chiefly by
maximum rate at which he can take in oxygen. With reg
to the economical use of muscle by the trained athl
Prof. Hill writes as follows :—

> " Clearly if a given movement can be carried out m
> economically—i.e., at the expense of less energy—then
> oxygen will be required for it, and its maximum durat
> can be increased. . . . This economy of effort can, in p
> be taught ; but just as all the practice in the world
> not turn some quite intelligent people into mathematicia
> so all the practice in the world may never turn some qu
> powerful and well-developed people into first-class athle
> Training and practice are essential, but they can only bu
> on an aptitude already there. If a subject uses his mus
> uneconomically . . . he will need an excessive supply
> oxygen. Consequently he will be an ineffective athlete
> he is uneconomical. Athletic prowess depends not o
> upon a large oxygen supply, but upon a low oxyg
> requirement."

Skill, power, and economy of muscular effort res
Prof. Hill says, from the effectiveness of the " quick, sile
overmastering, and generally unconscious reactions, dicta
by the nervous system on the receipt of urgent messa
from tendons, joints, and muscles, or from the little se
organs associated with the ear. . . . The instinctive sk
quickness, and economy of the gymnast or climber, of
mechanic, airman, tennis-player, or athlete, depend upo
vivid and readily reproducible picture in the brain or nerv
system, ' a picture,' as Pear puts it, ' of muscular exerc
in terms of the sensations which effective and success
movements produce.' "

These considerations are very pertinent to the climb
course at Klosters, and a timely study of them by the wou
be climber might save him disappointment.

THE DRIVING GRIP IN GOLF.

To the Editor of THE LANCET.

SIR,—Professional golfers should be grateful to Dr. W
Cuthbert Morton for the scientific confirmation in yo
issue of June 30th of the fact long appreciated by prof
sionals, but difficult to convey to pupils, that the golf cl
must be held with the wrist slightly extended, " especia
the left one," if full power is to be exerted in the gr
Can you explain why this should be ? I find golf pu
are much more ready to obey instruction when a logi
explanation of the reason for a position can be given.
slanting grip of the fingers with extended wrist see
unnatural and uncomfortable to most beginners.

One further point which Dr. Morton does not elabor
is the general impression among professionals that
grip is principally maintained by the forefinger and thu
of both hands. The real gripping power is, of course, in
flexion of the middle, ring, and little fingers, whereas
strain felt between or with the first finger and thumb
due to the sharp contraction of the first interosseous mus
which approximates finger and thumb to prevent the han
of the club from dropping into the groove or web betw
them. I am, Sir, yours faithfully,

DAVID ANDERSON

York Gate, Regent's Park, July 12th, 1923.

PROFESSIONAL CLASSES AID COUNCIL.

THE Professional Classes Aid Council, reconstituted
April, 1921, to carry on and extend the work arising out
the Professional Classes War Relief Council, has now co
pleted its second year of work. The council exists to relie
or assist in relieving, distress among the professional a
other highly educated classes and their dependents, and t
work has been steadily consolidated during the past
months. As a general rule the council does not give finan
assistance to persons suffering from misfortune which co
have been naturally foreseen and reasonably provided again
although in such cases helpful advice can frequently
offered. The aim in giving financial assistance is to ena
the recipient to become independent of further he
Doctors, nurses, and medical students were among th
helped directly and indirectly during 1922, the council of
association being careful to avoid usurping the functions
existing benevolent funds. The direct relief given is
present severely limited by want of funds. The h
treasurer of the association (of which Sir Clifford Allbutt
a patron and Dr. G. Newton Pitt, representing the Ro
Medical Benevolent Fund, a member of the council)
Mr. E. W. Monkhouse, and the offices are at 251, Brompt
road, London, S.W. 3.

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[1] The Military Surgeon, May, vol. lii., p. 555.

THE LANCET

No. 5213. LONDON, SATURDAY, JULY 28, 1923. Vol. CCV.

CONTENTS

THE WHOLE OF THE LITERARY MATTER IN THE LANCET IS COPYRIGHT.

ADDRESS on Environment and Health. By Charles P. Childe, F.R.C.S., M.R.C.P. 155

ORIGINAL ARTICLES.

mary and Secondary Resistance to the Induction of Cancer. By J. A. Murray, M.D., B.Sc.—*Illustrated*) 159
Immediate Prognosis n Nephritis, with Some Remarks on Uræmia. By). L. V. de Wesselow, M.B., F.R.C.P. 163
ondary Anæmia in nfancy: A Record of Some Clinical Observations. By Helen M. M. Mackay, M.D., M.R.C.P. 165
ulin. By Prof. J. J. R. Macleod, F.R.S., M.B., Ch.B. 198
phus Fever Epidemic Among the Greek Refugees. By Sir Patrick Hehir, K.C.I.E., C.B., C.M.G., M.D., F.R.C.S., F.R.C.P.—(*To be continued*) 209

VIEWS AND NOTICES OF BOOKS.

Text-Book of Therapeutics. Including the Essentials of Pharmacology and Materia Medica. By Prof. A. A. Stevens, A.M., M.D. 168
ltiple Sclerosis (Disseminated Sclerosis). Vol. II. f the Series of Investigations and Reports of he Association for Research in Nervous nd Mental Diseases ... 168
Common Neuroses: Their Treatment by Psychotherapy. By T. A. Ross, M.D., F.R.C.P.E.. 168
dical Diagnosis. By Prof. Charles Lyman Greene, M.D. 169
ité pratique de cystoscopie et de cathétérisme rétéral. By Prof. G. Marion and Prof. M. Heitz-Boyer 169
neralised Pain. Part II. f the Clinical Symptomatology of Internal Diseases. By Prof. Dr. Norbert Ortner. Translated by Francis J. Rebman. Introduction y Thomas Webster Edgar, M.D. 169
Selected Papers and Addresses. By Prof. William Williams Keen, M.D., LL.D. 169
Exploration clinique et diagnostic chirurgical. By Prof. Felix Lejars .. 170
The Evolution of Man. A Series of Lectures delivered before the Yale Chapter of the Sigma Xi during the Academic Year 1921–22. Edited by George Alfred Baitsell.............. 170
Topographische Anatomie dringlicher Operationen. By J. Tandler 170
Les désanglés du ventre; Maladies par relâchement des parois et organes abdominaux. By Dr. Chauvois 170
Grundriss der gesamten Chirurgie. By Prof. Dr. Erich Sonntag 170

LEADING ARTICLES.

The Annual Meeting of the British Medical Association 177
Cancer Facts and Cancer Theories.............. 177
Child Mortality in Scotland 178

ANNOTATIONS.

The Museum of the College of Surgeons 179
New Director-General of the Naval Medical Service 179
Outbreaks of Septic Sore-throat Spread by Milk.. 179
The Centenary of the Edinburgh Veterinary College 180
An Epidemic of Erythema Nodosum 180
Sterilisation or Segregation 181
Linitis Plastica 181
"Leaving it to Nature".. 182
Ophthalmological Training for Medical Students ... 182
Eleventh International Physiological Congress, 1923 183
The Administration of the Vaccination Acts 183

SPECIAL ARTICLES.

British Medical Association: Annual Meeting at Portsmouth: Civic Welcome.—Representative Meetings, July 20th and 21st.—Public Health Policy of the B.M.A.—Hospital Policy of the B.M.A. 185
Sixth Congress of the International Society of Surgery—(*Concluded*) .. 171
The Voluntary Hospitals During 1922 190
A Year's Work of the Scottish Board of Health 191
National Association for the Prevention of Tuberculosis—(*Concluded*).... 192
Paris: Medical Centre for the Service de la Navigation Aérienne.—International Congress for Social Hygiene Propaganda .. 194

MODERN TECHNIQUE IN TREATMENT.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

XXX.—The Treatment of the Hypertrophied Prostate. By Prof. Charles A. Pannett, M.D., B.S., F.R.C.S. 184

THE SERVICES.

Royal Naval Medical Service: New Director-General.—Royal Army Medical Corps 194

PUBLIC HEALTH SERVICES.

Reports of Medical Officers of Health: Carlisle.—Worcester.—Winchester.—Northampton.—Torquay.—Heston and Isleworth.—Hendon.—Ilford.—Spenborough.—Swinton and Pendlebury.—Tottenham.—Willesden 195

OBITUARY.

William Ford Robertson, M.D., C.M. 196

CORRESPONDENCE.

Lymphocytosis from Infections (Dr. H. Letheby Tidy) 197
Schistosomum Mansoni in South Africa (Dr. F. G. Cawston) 197

INDEX NOTICE.

The Lancet, Vol. I., 1923 176

MEDICAL NEWS.

University of London 205
University of Manchester . 205
University of Paris 205
Royal Society of Medicine 176
Lancashire Insurance Committee and the Spahlinger Treatment 197
King's College Hospital Festival Dinner 204
Royal Sanitary Institute . 205
Royal College of Physicians, Edinburgh 205
Payment of Panel Doctors in Cheshire 205
Scottish Board of Health: Precautions against Small-pox 205
Regulations for Labelling Dried Milk 205
People's League of Health 205

PARLIAMENTARY INTELLIGENCE.

House of Lords: Smoke Abatement.—Therapeutic Substances Bill.—Sale of Liquor to Children 206
House of Commons: Grants to Local Authorities.—Coroners and Juries.—Visit of Distinguished Russian Scientist.—Milk-feeding Experiments.—Poor-law Officers' Superannuation.—Houses under the New Bill.—Small-pox Commissioners—Medical Boards and Final Awards.—Allowances for Home Treatment.—Medical Commissioner and the Welsh Language.—Dental Inspection in Wales.—Panel Doctors and Treatment Allowances.—Insane Prisoners.—Nurses and Registration.—Small-pox at Brockworth Aerodrome.—Mortality from Small-pox.—Pernicious Anæmia.—The Army Medical Service.—Small-pox at Gloucester Aerodrome 206

NOTES, COMMENTS, AND ABSTRACTS.

A Directory of Bart.'s Men 210
A Book for Laymen on Heart Failure 210
Appointments 208
Vacancies............... 208
Births, Marriages, Deaths. 208
Medical Diary 210

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An Address

[ABRIDGED]

ON

ENVIRONMENT AND HEALTH.

eing the Presidential Address delivered at the Annual Meeting of the British Medical Association in Portsmouth on July 24th, 1923,

BY CHARLES P. CHILDE, F.R.C.S. ENG., M.R.C.P. EDIN.,
SENIOR SURGEON, ROYAL PORTSMOUTH HOSPITAL.

[AFTER welcoming the members of the Association nd calling attention to the previous meeting held at ortsmouth in 1899, Mr. Childe commented on the ast history and present development of the town. e proceeded :—]

During the past fifty years medicine has done finitely more to constitute itself a science than in all e previous ages. This has been mainly due to the ood of light thrown upon the specific ætiology of many seases by the epoch-making discoveries of Pasteur, nd the stimulus those discoveries have given to other orkers. Previous to this almost nothing was known the agencies concerned in the onset of any diseases, cept those of purely mechanical origin. Of such idespread and prevalent disorders as the surgical fections, enteric fever, tuberculosis, diphtheria, philis, malarial fever, pneumonia, and many others, e causes were entirely unknown, the speculations nd theories as to their origins were various—" Quot omines, tot sententiæ "—and their treatment was tirely empirical. All disease was a mystery. A eat deal of it is no longer a mystery. Approximately ne-half of the diseases with which we are acquainted e now known to have their origin in infection by ving organisms belonging either to the plant or to e animal kingdom, and the probability is that the st is not yet nearly exhausted. Besides this, it has een computed that nearly half the deaths that occur nnually are traceable to the same cause.

With the emergence of medicine from the mysterious o less a revolution has occurred in the practitioner of edicine. While a good bedside manner is still a aluable asset, and will so remain in so far as it connotes sympathetic and human attitude towards the sick nd suffering, and while from a business point of view good shop-front no doubt has its value, no longer e the doctor's brains assessed by the sheen of his ll hat or the length of his frock-coat. Like medicine, e doctor has become less mysterious, less aloof from nd superior to his fellow men. Knowing more he as become less omniscient. Standing on surer ground has become less pretentious. The medical priest- aft, reminiscent of a time when the medicine-man as more priest than physician, and more charlatan an either, has disappeared or is disappearing. This all to the good, and tends to a more enlightened nfidence between doctor and patient.

Again, so much relating to the discoveries and lvances in medicine nowadays finds its way into the y press that the general public has, apart from its chnical aspects, a broad knowledge of the progress edicine is making, and is alive to its new develop- ents. This is again to the good. A strong opposi- on is always an incentive to good government. The lvent of a wideawake and informed public tends keep the profession up to the mark. It adds nothing the dignity, not to mention the security, of the octor to be questioned by his patient on some new eatment or phase of a disease he has never heard of, nt with which he finds his patient has more than a owing acquaintance.

It was a natural sequence of the elucidation of the usative agent in many of the infectious diseases at scientific effort should be directed to two main ojectives: first, to the discovery of means of pro- ucing an artificial immunity similar to the active natural immunity which it was a matter of common knowledge resulted after recovery from an attack of many of them; secondly, to producing immunity reactions which should have the effect of neutralising the toxic products of the invading organisms during an attack. In both of these directions remarkable results have been achieved, both by what is known as vaccine prophylaxis and therapy, and antiserum prophylaxis and therapy.

Successes in Prophylaxis.

The most completely successful example of *vaccine prophylaxis* is that of vaccination against small-pox, introduced by Jenner in 1798. This remarkable discovery was the result of shrewd observation and logical deduction. It was, nevertheless, empirical; the principle on which it rested was not understood until the work of Pasteur more than half a century later. In countries where vaccination is twice practised, small-pox has practically ceased to exist, and its sporadic outbreak from time to time is a warning to the public of neglect of the means to prevent it. In typhoid and paratyphoid fever, by measures along the same lines, immunity lasting for a period of one or two years can be secured, and has greatly reduced the incidence of these diseases both among civilians and soldiers.

Again, the mortality from rabies has been reduced from 16 per cent. to a fraction of 1 per cent., an active immunity being capable of being produced here after infection has already taken place, owing to the lengthy incubation period of the disease. *Vaccine therapy*—that is, the production of active immunity after attack by a known micro-organism—so ably advocated by our own countryman, Sir Almroth Wright, has given very beneficial results in staphylococcus infections, skin affections, &c. Of *antiserum prophylaxis* the best example is that obtained in tetanus. The mortality following Fourth of July injuries in America has ceased to exist owing to its use, and no less life-saving results were obtained by the same means in the Great War. The most familiar and the most successful instance of *antiserum therapy* is that of diphtheria, which has reduced the mortality from 40 to 10 per cent., and, if used on the first day of the disease, to almost *nil.*

These are veritable triumphs of strictly scientific medicine. In other diseases more or less success has been achieved. But closer investigation has shown that there are many factors requiring elucidation which undoubtedly influence the result—such as choice of route, recognition of different types of the same disease, &c.—and it will certainly take many years of patient endeavour before the ultimate possible results in securing immunity are obtained. In many instances prophylaxis or cure has eluded us, and the results have proved disappointing. The above may be termed the result of scientific effort, either preventive or curative, directed towards the individual.

There are other diseases, which have been attacked from a totally different angle—namely, by studying and combating conditions which favour the growth, dissemination, and virulence of the infecting organism, by so altering environment and increasing natural resistance, whatever that may precisely mean, that many diseases which have been very prevalent and very fatal in the past have almost or entirely ceased to exist, and are no longer of any account. Let me give you one or two very familiar examples.

Take typhus fever. During the last century it prevailed in all the large cities of Great Britain and the Continent. So late as 1875 in England and Wales there were 1499 deaths from the disease. During recent years the name " typhus " has seldom appeared in the Registrar-General's returns. It is a disease essentially dependent on filth and overcrowding. Bad as these conditions are even now in our large industrial centres, the disappearance of this disease is evidence of an improvement as compared with half a century ago—an improvement in environment and an improvement in natural resistance, owing to better living conditions, sufficient to have caused its disappearance altogether.

After the peace of 1815, following a long and exhausting war, when the economic position was somewhat similar to that existing at the present time, typhus fever and relapsing fever, which occurs under similar conditions to typhus, were rife in England and Ireland. No such catastrophe has accompanied the economic depression following the last Great War.

Take, again, typhoid fever. It is a water-borne disease. Bad drainage and a contaminated water-supply are the factors favouring its distribution. Its prevalence or the reverse in a community is the measure of their sanitary intelligence and enterprise. Filth, overcrowding, and bad ventilation are factors conducing to its prevalence, by lowering natural resistance. The marked decline in typhoid fever is again the result of an improvement in environment. Typhoid fever has declined from 375 per million in 1870 to 25 per million at the present time. In Portsmouth typhoid fever, quite prevalent in the town when I came here 30 years ago, has almost ceased to exist.

These are examples of diseases which have disappeared, or are disappearing, owing to action following an intelligent study and comprehension of the conditions and environment favouring their distribution.

Now, "environment" is obviously a very wide term. It embraces living conditions generally. The amount and quality of food and water, the presence or absence of domestic hygiene, the supply or not of good drainage, the furnishing or not of healthy conditions in factory and workshop, the prevalence or not of smoke and fog, the provision or not of adequate open spaces, playgrounds, and recreation grounds, access or not to sound education—these and many others are all factors in environment. And it is satisfactory to note that these matters are receiving from governments and local authorities some of the attention which all of them deserve. But I propose to-night to consider for a few moments the special environmental factors governing the slum areas of our great industrial centres—the lack of fresh air and sunlight, and the cramped and penalising conditions to health, both moral and physical, owing to overcrowding; and to inquire what bearing these factors have upon four out of five of the most formidable endemic scourges which afflict all northern civilised peoples to-day.

THE BEARING OF ENVIRONMENTAL FACTORS ON DIFFERENT DISEASES.

The five scourges I allude to are cancer, tuberculosis, rickets, venereal disease, and alcoholism. Tuberculosis and rickets account for most of the cripples we see about us; cancer, tuberculosis, venereal disease, and alcoholism account for most of the deaths; venereal disease and alcoholism account for most of the misery and moral degradation of our race.

Cancer.

We may dismiss cancer at once from the count. The humiliating confession must be made that we know very little about it. That it has some relation to civilised environment seems evident from the fact that it is a comparatively rare disease among primitive races, and that it is certainly making rapid headway among all civilised peoples. But of the nature of the environment favouring its activities we are in complete ignorance. It is neither foul air nor fresh air, neither hardship nor indulgence, neither poverty nor riches. Cancer like death—

> "Æquo pulsat pede pauperum tabernas,
> Regumque turres."

The only things we know about it which are worth knowing are its age-incidence, its relation to chronic irritation, and the fact that it is in its beginnings a local disease, and that therefore it can be cured by early removal in those situations where removal is possible.

This is practically all we know about cancer. I wish to make only two comments. The first is that this knowledge is not enough. In an age which has yielded secrets of so many diseases it is a point of honour with the medical profession not to rest content till this pressing problem has been solved. With the
public it is not only an obligation but, from the poi
of view of their own interest and safety, a vit
necessity to furnish the financial means of solutio
and to see to it that research is not crippled or stint
by any niggardly parsimony.

The second comment I make is this: The mo
important fact we know about the disease is that i
its beginnings it is local, and that its course is a centr
fugal spread from its local point of origin. Is th
knowledge anything like as productive as it might be
Undoubtedly it is not. Notwithstanding the fa
that cancer has been cured over and over again b
modern operation—a fact which in itself proves th
it is curable—yet I believe patients come no earli
to the doctor with it than they did 30 years ag
though time is the very condition of the only cure w
possess for it. Many medical men, and I confe
I am one of them, are of opinion that there is co
siderable room for improvement in this directio
Without resort to any sensationalism some obvio
steps could be taken to spread the knowledge of
few very simple facts about cancer. This wou
give a by no means unwarranted ray of hope to t
public and would enable some of the victims of th
terrible disease to apply in time to have, at all event
a chance of cure or freedom from recurrence, whic
ever you like to call it. This by the way.

I pass on to the consideration of the other fo
scourges—tuberculosis, rickets, venereal disease, ar
alcoholism.

Tuberculosis.

Tuberculosis first. We know the cause; it is t
tubercle bacillus. We know also the prime a
essential conditions of its cure; they are fresh a
and sunlight. These are not only the essential co
ditions of its cure, but are almost the sole condition
Those of you who are interested in the subject w
have an opportunity of visiting the establishments
Alton and Hayling Island, under the able administr
tion of Sir Henry Gauvain, where the cures are fre
air and sunlight. Dr. A. Rollier, of Leysin, read
most instructive paper at the Glasgow meeting la
year, and quoted many instances of cures, and lasti
cures, by these agencies in all regions of the bod
It is foreign to my purpose to discuss to-night t
method or supposed method of their action, or t
method of their application. If, then, these agenci
fresh air and sunlight, are, as we know they are,
powerfully antagonistic to tuberculosis—whether
directly controlling the activities and virulence of t
tubercle bacillus itself or by fortifying the natu
resistance and so enabling the human organism
establish an immunity to it (it matters not, the res
is the same)—are we not justified in the conver
conclusion, that the breeding ground of this disea
the environment most encouraging to its activiti
are the sunless, airless, overcrowded, and insanita
slum areas of our great cities, where houses are bu
40 or more to the acre, and stand back to back, a
side to side, like any jig-saw puzzle, so that fresh
and sunlight, the proved destructive agents of t
tubercle bacillus, can never enter? Is it a sou
economic proposition to equip and maintain, at t
cost of millions of the taxpayer's money, sanatoriu
for the so-called cure of tuberculosis, while we gua
intact the very preserves of this disease by the exclusi
of fresh air and sunlight, which cost nothing at a
and maintain in our midst a soil which can breed mo
tuberculosis in a week than all our sanatoriums c
cure in a year? Dr. Rollier says:—

> "Housing has played an immense part in the genesis
> child and adult tuberculosis; the community bears t
> responsibility of the waste of human lives through insanita
> houses."

The industrialisation of Sweden since 1870 has be
accompanied by a high adolescent mortality due
pulmonary tuberculosis. Sandberg, commenting
this, says:—

> "The cause of this difference between earlier and mo
> recent times seems to us to be in the fact that formerly t
> adolescent boy and girl remained at home for a longer ti
> —nowadays one goes more frequently and at an earlier a

the city or factory. The new conditions of existence ng, in many cases, increased dangers to health and life, ngers which, especially in the case of women, often lead to berculosis."

In 1885 the tuberculosis gland cases admitted to e Alexandra Hospital for Sick Children, Brighton, nstituted 6·5 per cent. of all admissions. In 1899 ey were 3·5 per cent.—a reduction of nearly 50 per nt. Between 1885 and 1899 Brighton has swept ay most of its insanitary areas. Numbers of nilar instances could be quoted. It is no unwarrantle assumption that by permitting—and that is all have to do—the sun and fresh air into our slum eas we should see a very marked general decline in e incidence of tuberculosis.

Rickets.

Consider next rickets. Its ætiology is unknown. iere are two opposing theories as to its origin—the etetic and the hygienic. There are those who sitively assert that it is a deficiency disease; that is due mainly to lack of fat-soluble A. There are hers who as stoutly deny that diet has anything do with it. We may leave the theorists to settle eir differences and turn our attention to certain cts about it which have long been established, and rtain other facts which have recently come to light. never occurs among races living under natural nditions, and is especially prevalent among the poor Europe and America living under so-called civilised dustrial conditions—in other words, the thoroughly d hygienic conditions of overcrowding and absence fresh air and sunlight. Among the well-to-do is practically unknown. In India, on the other ınd, as recently shown by Hutchinson, it is a disease the rich. It does not occur among the poor bouring class who live an open-air life, but is evalent among the rich Mohammedans and Hindus, ho are confined in airless and sunless rooms. utchinson discovered also this remarkable fact—at late rickets was restricted to females, who alone e confined, according to the purdah system of lation as practised by the wealthy natives of India. gain, eminent observers in Glasgow, who have quite exceptional acquaintance with rickets—it being, you know, very prevalent in that city—have ways associated the disease with overcrowding and ck of hygienic conditions and sunshine, which you so know are conspicuous features of that great hive industry. According to Miss Fergusson, 50 per nt. of the children in the poor quarters of Glasgow e rickety—a vastly smaller proportion in garden ties, such as Bournville. The prevalence of rickets, e says, is associated with close confinement in nements. Most important of all, we have the cent experiments of the Lister Institute in Vienna. hey prove conclusively that a deficient diet can only oduce rickets in the absence of sunlight. If undant sunlight be present a deficient diet is powerss to give rise to it. Lastly, we have the significant ct that the sun's rays without any other treatment hatever can cure it—an explanation of the oftpeated dictum that anybody can cure rickets in the mmer.

All this does not prove that the absence of fresh air d sunlight is the cause of rickets; but it does prove is—that in overcrowding, confinement, want of esh air and sunlight, we have an environment nducive to the development of rickets, either by the pply of conditions favourable to the activities of the rus, whether microbic or otherwise, or by lowering tural resistance to it. Conversely, that fresh air d sunlight and good hygienic conditions furnish environment which is powerfully antagonistic to the sease; that they have either the power of damping wn the activities of the virus whatever it is, or that ey can so alter the metabolism of the body as to rovide an increased resistance and immunity to it. hichever is the method, the result is the same. hese facts appear to indicate clearly and unmistakably e way to the control of this crippling and dangerous isease. And, as Mellanby says, its eradication ould do away with a great deal of the bone deformity, improve the physique, lower the infantile mortality, and, most important of all, improve the teeth of the people of this country beyond recognition.

Venereal Diseases.

Let me invite your attention in the next place to venereal diseases, which have figured so largely in the public eye during recent years, are discussed in every drawing-room, exhibited at every picture-house, and with regard to the most suitable methods of controlling which there are acute differences of opinion, both among medical men and the lay public. They are the diseases of immorality. The contributing environmental factor here is the indiscriminate admixture of the sexes of all ages, a necessity of their living conditions. It is not, of course, contended that by an improvement in housing immorality would be stamped out, but it is contended that the conditions of overcrowding, without regard to age or sex, which exist in our industrial centres make the practice of morality wellnigh impossible.

Let me put before you a few facts; they are taken from the report of Dr. A. K. Chalmers, the medical officer of health for Glasgow, for 1921. There is no intention to single out that city as a sink of iniquity, or an example of a condition of things peculiarly revolting to the conscience of civilised humanity, and I have very little doubt its case could be paralleled in our own borough of Portsmouth; but I have the facts for Glasgow, and I have not similar facts for Portsmouth. In Glasgow, out of a population exceeding a million, over 600,000 live in one-roomed or two-roomed tenements. Under the heading "Sex overcrowding in small houses," Dr. Chalmers gives the following appalling examples:—

> "In a one-roomed house a father of 52 occupied the same bed with a mentally defective daughter of 24, who had an illegitimate child of 10. In another, with space for five adults, a father and daughter shared the same bed. In another a mother shared the same bed with two sons of 19 and 20 years respectively. In two-roomed houses, in one instance a son of 19 and a daughter of 21 occupied the same bed; and in another a son of 19 and a daughter of 25, who was pregnant."

However revolting these facts may be, it is right that the public should be made aware of them. This, then, being an example of the state of affairs in our industrial centres, it may be confidently stated that a great deal, at all events, of immorality and its consequences, venereal disease, is the direct result of environment—that the conditions existing make either the teaching or practice of morality impossible, and furnish the breeding ground for venereal disease.

Have we not, it may be asked, missed one phase of the problem, and are we not somewhat out of touch with the situation, with our societies for the prevention of venereal disease and for combating venereal disease quarrelling amongst themselves as to the best means of meeting the evil, and local authorities and the lay public equally divided, when conditions such as I have depicted are rampant in our midst? It is this aspect of the problem—the immorality and its consequence, venereal disease, which are the direct result of overcrowding without regard to age or sex—which I wish to lay particular stress upon here.

The Abuse of Alcohol.

Consider, lastly, the abuse of alcohol. There is no doubt that, without anything in the nature of prohibition in this country (and I believe it to be foreign to the instincts of our people to have their lives, what they may eat, and what they may drink, regulated by the policeman), there has taken place during the past 50 years a steady move in the direction of greater sobriety among all classes of the community. Among the upper and middle classes drunkenness was the fashion less than a century ago. It is now a disgrace. In the army, navy, and mercantile marine there was, 50 years ago, infinitely more drinking than there is to-day. In the streets of our towns the drunken man of any class is not nearly such a familiar sight as he was a generation ago. This must be attributed broadly to social evolution, to general civilising influences—better education and the inculcation of greater self-respect, which such influences promote. There are, of course, many factors at work here ; but in the forefront of civilising influences is the improvement of the home. So long as the public-house is more comfortable and more attractive than a man's home, the former will claim his leisure hours. Give him a comfortable and respectable home, and the lure of the public-house will automatically diminish. In the debate on Lady Astor's Bill, a few months ago, a good deal was said about the improvement of the public-house ; but nobody suggested that, by devoting greater attention to the home, we might go a long way to improving the public-house out of existence altogether. Drunkenness stands in much the same relation to bad housing conditions as immorality and venereal disease, and, moreover, is admittedly a potent factor in the dissemination of the latter.

The Economics of the Abolition of Slum Areas.

In the foregoing remarks I have endeavoured to emphasise the relation of the special environmental factors of the slum areas—lack of fresh air and sunlight, and overcrowding—to four out of five of the great endemic scourges afflicting the community at the present time. I have said nothing of their relation to epidemic diseases, though there is no doubt that some of the latter are powerfully influenced by the same factors. For instance, pneumococcus lung infection is certainly a disease mainly of cities and crowded places, the infection spreading from pre-existing cases or healthy carriers. Observations in South Africa showed that natives who had recently arrived at the mines and occupied crowded compounds were most susceptible ; and Gorgas, in a report upon pneumonia in the Rand mines, draws attention to the fact that there was the same high incidence among labourers in the Panama Canal zone, until they were removed from crowded compounds and encouraged to live in separate huts. The high mortality attending measles is probably attributable to similar conditions. Epidemic disease is, however, more elusive and less under control, and for that reason I have omitted it from argument.

If, then, I have submitted evidence that, by a determined attack upon our slum areas, there would be a reasonable expectation of making a beginning of the end of four out of five of our most formidable endemic diseases, the question is, Would it be worth while ? Not as a sociological venture, or on humanitarian grounds, or as a moral obligation, on any of which there would be little difference of opinion ; but " would it be worth while " as a business proposition ? Because, however satisfying it may be to our consciences to prate of social and moral duties to our fellow men, when it comes to doing anything, and especially to spending taxpayers' and ratepayers' money, it is usually the business and economic aspect of any question which mostly counts. It is, therefore, from this point of view only that I approach it, and I omit all moral considerations. Besides, moral values cannot be assessed in pounds, shillings, and pence, though nobody would deny that they represent a very real asset.

In a paper read at the meeting in Glasgow last year entitled " The Economics of Public Health " Lieut.-Colonel Fremantle, consulting medical officer of health for the County of Herts, by a series of calculations, estimates the total direct material loss in England and Wales from sickness and disability at a minimum of £150,000,000 a year. From tubercle alone the estimated loss is £94,000,000 a year. In the United States of America, with a population three times as great as England and Wales, the estimated cost of sickness and death is £600,000,000 a year, of which at least one-third is considered preventable. Taking the cost to this country of sickness and disablement at £150,000,000 per annum, the country could spend without loss £50,000,000 annually, or, capitalised at 5 per cent., £1,000,000,000 on clearing the slum areas and securing better housing and living accommodatio provided that the cost of sickness and disablement we thereby reduced by one-third.

What actual sum would go to the credit side of th nation's health bill it is obviously impossible t determine. It would admittedly, therefore, be speculation. But it would not be a bogus ventur An assured dividend of considerable amount is i sight. The improved physique of the nation ; it better health ; the diminution certainly, the extinctio possibly, of such diseases as tuberculosis and rickets the improved moral tone of the people, and th resultant diminution of venereal disease and i consequences ; decrease in the consumption of alcoh with its disastrous effects on infantile and adu mortality, with the misery and moral degradation brings to the home, with the loss of time, increase industrial accidents and industrial inefficiency entails—these and other items are the prospecti dividend. Whether it would or not strike £50,000,0 off the annual health bill is the speculation. In th connexion I would remind the over-cautious and tho averse to any kind of speculation or any degree risk, that it is the speculators who have made th great empire—the men of courage and enterpris men who have faced the uncertain and the unknow and have not been afraid to take risks. And if have not been afraid to speculate in adventure, arms, in trade, and in business, why should we afraid to speculate in health ?

To face the risk would require a bold and imagin tive statesmanship. It does not belong to the busine outlook of the parish pump, only prepared to estima in pounds, shillings, and pence the return on t capital expenditure. It would almost certain eventually result in a real economy to the Stat What we are doing now is to provide the breedin ground for the mass production of disease with o hand, and with the other paying out millions of t taxpayers' and ratepayers' money to deal with t end-results of the very diseases we are fostering our midst. It has been frequently said, the peop make the slums. Such a pessimistic assumpti would sound the death-knell of all progress. But it nothing more than the comfortable argument of t man selfishly indifferent to the obligations of citize ship and regardless of his duty to the body-polit It is flatly contradicted by the fact that through the ages man, like every other living thing, has be the product, not the cause, of his environment. T slums make the people you find in them, and the o astonishing fact is that they can breed any other so It is a testimony to their physique and spirit a grit, no less than to the universal natural law of t survival of the fittest, that some of the inhabita of the slums win through such an environment a escape the moral and physical ruin which engu those of weaker fibre.

The industrial revolution which occurred in t last century accounted for the urbanisation of population, and the herding together of millions workers in our industrial centres. This has be going on ever since. The early hour at which w commenced, the long working day, entire absence rapid transport, or rather of any transport at necessitated their centralisation in the heart of great towns, where land has consequently become greater value than health. These conditions reversed to-day. Powerful centrifugal forces h come into play, and have come to stay. The work day as a rule begins later, the hours are shorter, day for half the year is longer owing to the Dayli Saving Act, and the means of rapid transport available, and are becoming increasingly availa every year. It has become, therefore, practicable many instances for the worker to live further fr his work—in other words, to move from the cen towards the periphery of our large towns, where la is cheaper and where it becomes, therefore, a busin proposition to build on town-planning lines, and av the past errors of herding human beings toget like sheep in a pen or pigs in a sty.

Air Space and Sun Space.

In this connexion it would seem that the first and ost essential requirement in future building is to duce the density of the houses—in other words, e number to the acre ; and it is disappointing, and the opinion of many a grave defect in the Government's last Housing Bill, that no such restriction pears. In submitting town-planning schemes, wever, local authorities have, under the Housing ts, powers to regulate for this, and a memorandum om the Ministry of Health suggests 12, 10, or 8 uses to the gross acre as suitable density requirements according to the nature of the neighbourhood. this in the opinion of the Ministry is the correct quirement for health, what are we to say about uses built 40 or more to the acre? The only swer is that they should be swept away wholesale the earliest possible opportunity.

The air space and sun space round the house is of finitely more importance than the size of the house self, or whether it contains a parlour or not. The amped crofter's cottage does not produce rickets d tuberculosis, because his children live mostly in e sun and air round their dwelling ; but children cabined, cribbed, confined" in the dark sunless d airless environment of our large towns are viting both all the time. The most important ucational requirement of domestic hygiene and its ghest fulfilment is the open window, night and day, mmer and winter. It is astonishing how quickly e human organism abjures the hothouse conditions civilised living and adapts itself to its natural vironment, fresh air. The tuberculous patient, ter three months' open-air treatment in a sana- rium, cannot endure the closed window in his own ome. The tuberculous children at Leysin in witzerland, and at Alton and Hayling Island in this ountry, live practically naked in the open air, and y that habit and that habit alone throw off a most rmidable and deadly disease. Why, then, all the are of healthy children, with their active metabolism apable of adapting itself to almost any requirement, o wrap them up in the warmest of clothing, confine hem in hot rooms with windows shut, keep every raught from their bodies, and submit them to eneral hothouse conditions suitable only to the d whose metabolism is barely sufficient to keep ody and soul together, and whose clock has almost un down?

Modern civilisation is suffocating itself in the olluted atmosphere and darkness of our great industrial cities. The need of pure air and sunlight, of hich there is plenty about, and to be had for nothing, as never so insistent as it is to-day. These great ifts of nature were plentifully supplied to primitive an, and were his only sure defence against disease. hey are as bountifully given to civilised man, but e seems to have lost sight of their value, or to have eliberately turned his back on them, while he requires whole volume for the mere nomenclature of his numerable diseases.

Sociology and Medicine.

Perhaps apology is needed for touching to-night n a problem which may be considered rather a ociological one than one of strictly scientific medicine. ut apart from the fact that I believe a wide latitude permitted in the Presidential Address to this ssociation, my choice of subject can, I think, be ustified by both local and general as well as scientific onsiderations. First of all, it does not seem to be n unfitting subject to bring to your notice in the own which bred Charles Dickens and Walter Besant, ho devoted their unrivalled literary talents to epicting scenes and characters drawn from our ums, and such as our slums are only too familiar ith. Secondly, although this borough has witnessed ome of the most brilliant pageants and displays in he history of this country, and although you are itting here in what we are proud to think is one of he finest town-halls in the kingdom, yet there is an bverse to the shield, and round the corner we can introduce you to slums as pestilential and overcrowded as any to be found in the land. Further, although the environment of the wage-earning classes, in our industrial centres, and its effects may in part be a sociological question, I have endeavoured to show that it is inseparably linked up with, and *is* in fact the greatest of all our problems of preventive medicine, the most rational and the most scientific of all medicine. And if this is so, then it is up to the medical profession, both individually and through this great Association of medical men, to educate and lead public opinion in this matter, and to strengthen the hands of governments and local authorities, on whom will ultimately devolve the responsibility, no less than the odium, of providing the remedy. Concentration on the prevention of disease, on strengthening resistance to disease, by the improvement of environment, rather than on the search for cures or palliatives when the damage is already done ; more attention to stimulating and fortifying the natural defensive mechanisms against disease, less to direct attack on disease itself ; as Professor Wynne so ably put it last year, concentration on the environment rather than on the individual—this appears to me to be the most scientific, the most economical, and the most productive means of combating the worst of the evils from which the community suffers. If, in conclusion, I might sound a personal note, it is this—that as Chairman of the Health and Housing Committee of this great borough, by the goodwill of my colleagues on the Council, this is a conclusion forced upon me by no mere theoretical considerations, but by an everyday acquaintance with undeniable facts.

PRIMARY AND SECONDARY RESISTANCE TO THE INDUCTION OF CANCER.[1]

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I.—Primary Resistance.

The researches on experimental carcinogenesis of the past ten years have familiarised pathologists with the constancy with which a continuation of the effective stimulation over a considerable time is essential to successful induction of cancer. This feature of the course of such experiments harmonises with the chronic character of the irritations which clinical experience of the disease in man and animals has shown to be nearly universal in those forms of the disease where such a nexus can be inferred. Taken in conjunction with the histological identity of the lesions, it gives us reasonable assurance of the fundamental identity of the processes involved in cancer as it occurs naturally and under experiment. Of all the methods which have been used to produce cancer in experimental animals (X rays, animal parasites, tar, paraffin, arsenic) the application of tar, or tar products, has been most widely employed, and our knowledge of its action is correspondingly extensive. In what follows this is the only method to which reference will be made, but it must be clearly understood that once malignant growth has been started by this means, there are no characters, clinical or microscopic, by which the tumours can be distinguished from those of the same tissue produced by other agencies or arising spontaneously —i.e., without known association with external agencies.

The length of time which elapses from the beginning of tarring till real autonomous growth sets in shows great variation even in animals of the same species. In the mouse this interval may be as short as three months, or as much as 18 months, and in one experiment a mouse remained free from growth, although tar had been applied to the same area twice weekly for more than 18 months. The majority of mice, however, develop skin carcinomata within six to nine months of tarring applied twice weekly. The extent of the area painted appears to have little influence. Very similar results have been obtained by painting the whole dorsal surface of the animal (Deelman), or an area of a square centimetre (Fibiger and Bang) or less (Murray and Woglom). The frequency of the applications, as might be expected, affects both the rapidity of induction and the percentage of success. Even a reduction from twice to once weekly prolongs considerably the interval necessary to produce cancer in mice, and the majority of workers have made their applications on alternate days or three times a week.

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[1] Read at the Cancer Congress at Strasbourg on July 23rd, 1923.

An interesting question is whether there is an upper limit to the intensity of the stimulation which may be followed by cancer production. In an experiment on rabbits in this laboratory it was found that bi-weekly applications of ethereal extract of tar to a small area on the nape of the neck produced highly inflamed and painful excoriations within a month. The applications were discontinued for two to three weeks, and then begun again, but only once weekly. The irritative phenomena did not recur, but after six to eight months from the beginning of the experiment—two rabbits out of 15 showed localised progressive lesions which continued after painting was stopped, and proved to be typical squamous-cell carcinomata when examined microscopically after excision. When it is remembered that Yamagiwa and Ichikawa had to persevere for two years to produce carcinoma of the rabbit's ear and that neither Fibiger nor Leitch (personal communications) have obtained progressive autonomous growths after the same length of time in the same species, the suspicion seems justified that the success in this experiment was in part due to the less severe and more widely spaced stimulation. As pointing in the same direction, it may be mentioned that cancer has never been observed in the workers in chromic acid factories, in whom chronic ulcerations, known as chrome sores, are common. Then again, X ray cancer has rarely supervened at the site of X ray burns and never after radium burns, but rather in areas subjected repeatedly to slight amounts of irradiation. Contrast also the occurrence of carcinoma of the skin in locomotive engine-drivers exposed to the irradiation from the open fire-box with the fact that the much more intense stimulation of the finger-tips by pipe-smokers in pressing down the glowing tobacco is apparently never followed by cancer.

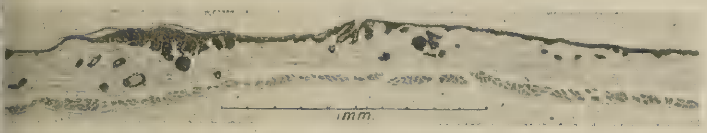
According to Deelman, the association of another kind of injury with tarring results in a shortening of the time necessary to produce cancer. Deelman scarified the dorsal surface of mice immediately before tarring. The treatment was carried out on alternate days for a week and then tarred without scarification thrice weekly for one month. Papillomatous new growths, going on to malignant new growth, supervened after five to eight weeks after the beginning of the experiment—i.e., roughly one-quarter of the time necessary without scarification. Deelman considers that scarification merely permits a more intimate application of the tar to the deeper layers of the skin, but the following observations suggest that a more fundamental significance should be attributed to it. When the area scarified and tarred is small the time of cancer production is not shortened in anything like the proportion obtained by Deelman. It is also significant that he found that repetition of scarification after the first week did not further accelerate the onset of neoplastic change. It is as if the trauma, and the reparative changes following it, had put the cells in a more receptive condition for the carcinogenetic action of the tar.

The relation of trauma to the induction of new growth is further illuminated by the work of Drew on the mechanism of repair by the method of tissue culture. It has been known for a long time that actively growing embryonic tissues, and tumours also, proliferate immediately when placed in a suitable medium outside the body. The quiescent tissues of the young or adult animal, on the other hand, do no begin to grow till after the lapse of an interval mor or less prolonged. Thus, Drew found that heart o kidney of the rat may lie dormant for from 10 to 1 days in a medium in which the correspondin embryonic tissues, and tumours, would have show vigorous growth in 24 to 48 hours. When a filtere saline extract of disintegrated rat kidney which ha been incubated at 37° C. for two to four hours added to the culture-medium, adult tissues begi growing at once and in 48 hours spread out on th cover-glass in a sheet of healthy dividing cells. Th initial delay has been eliminated. If the disintegrate kidney instead of being incubated is maintained a 0° C. for two hours and then filtered off, the fluid i devoid of this actively stimulating property. Whe a corresponding cold extract is prepared from rapidly growing transplantable carcinoma or sarcom of the mouse it is found to be as rich as, or riche than the extract of incubated damaged norma tissue, in the activating substances. From thes observations, many times repeated and always wit the same result, it is concluded that these malignan growths produce continuously of their own accor growth-stimulating substances which normal tissue only elaborate in response to cell damage. A direc relation exists between the growth-stimulating powe of the tumour extracts and the rate of growth of th tumour used to prepare it. This suggests strongl that the biochemical mechanism by which their proliferation is maintained is, at any rate in part, by th elaboration of this growth-activating substance o substances. It is not desirable to attempt, at th present stage of these investigations, a speculativ development of this conception of the nature o neoplastic proliferation further than to point ou how well it accords with the additive effect of traum in accelerating carcinogenesis as shown by Deelman A certain amount of activating substance is probabl produced by any kind of cell damage, and when b constant repetition this production has becom automatic, proliferation will continue after remova of the cause of protoplasmic disintegration. Temporary hypertrophies would, in this conception correspond to the purely reactive production o activator, ceasing when the irritant is removed benign growth to an autonomous production i small amount, and malignant growth to a mor abundant production.

In the past one has been accustomed to regard th preparatory period of chronic irritation which precede the development of cancer as occupied in a gradua cumulative removal of resistance on the part of th organism to the unrestricted powers of growth o its constituent cells. This resistance, variousl designated by inhibition, internal tissue tension, an similar fantastic expressions, was regarded as holdin the tissues in check. The preceding discussion lead to a somewhat different conception—viz., that i cancer the cell acquires new properties, exploitations if you will, of the normal cell activities, but actin in a new way with disastrous consequences to th organism.

Two other features of the development of cance under experimental conditions bear on this conceptio of the secondary character of the neoplastic transformation. The first is the discrete focal characte of the process. Growth begins in isolated, usuall minute, areas and not diffusely throughout the whol zone of application of tar. The second is the existenc of a latent period, very little affected by continuatio of the irritant as indicated by Deelman's work an emerging clearly from the deliberate experiments o Leitch and of Bang. These authors working independently stopped the application after two, three, o more months in animals which had shown no proliferative changes or only slight hyperplasias, and foun cancer appearing after a further interval at the treate site. In several instances the local hyperplasia ha regressed and the skin had become smooth and th new growth started in the otherwise normal hairles area.

1



. 1.—Slight proliferative changes at margin of tarred area of skin in a mouse which had spontaneous mammary carcinoma excised. Duration of tarring, 23 weeks.

2

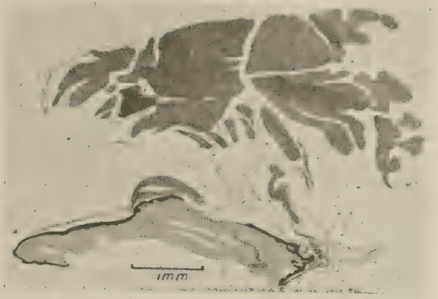


FIG. 2.—Absence of new growth in area tarred with ethereal extract in the mouse in which the alcoholic extract had produced the carcinoma shown in Fig. 3.

3

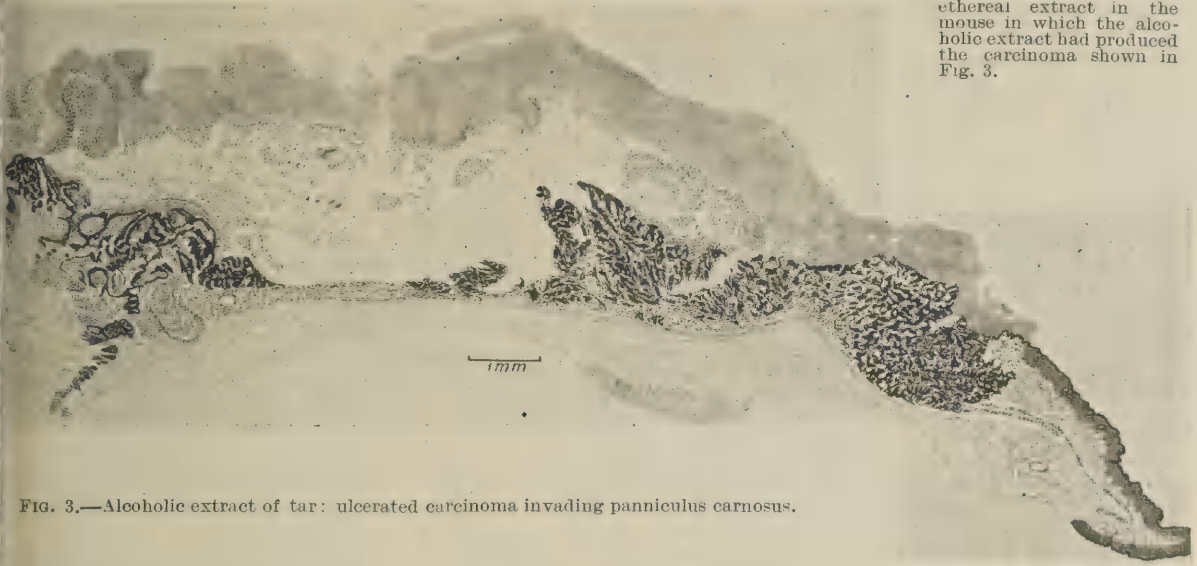


FIG. 3.—Alcoholic extract of tar: ulcerated carcinoma invading panniculus carnosus.

4

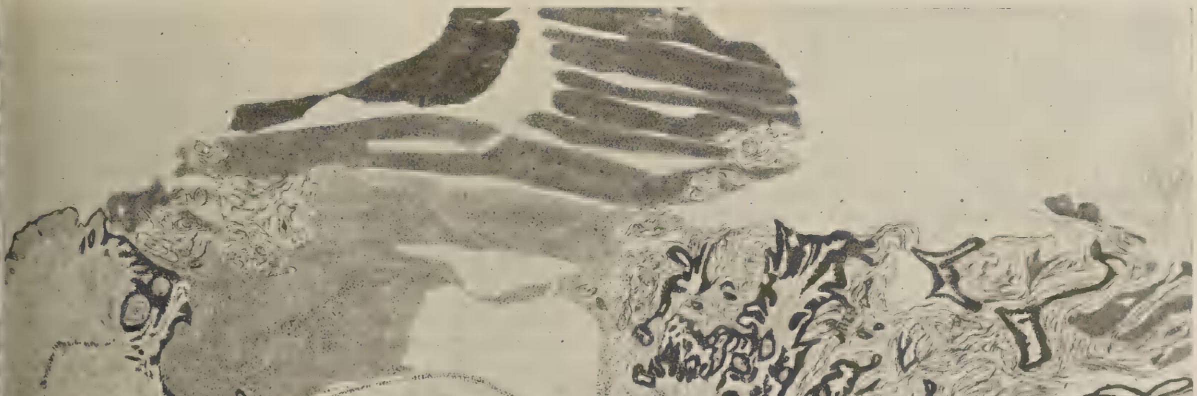


FIG. 4.—Highly keratinised carcinoma (right) produced by alcoholic extract of tar, adjoining deeply infiltrating ulcerative growth (left) produced by ethereal extract.

II.—Secondary Resistance to Cancer Production.

The strict localisation of experimental tar cancer to the area painted would lead one to expect that subsequent tarring of another area remote from the first would again result in the production of a fresh primary growth at the new site. As a rule, experiments of this kind end prematurely by the death of the animal from intercurrent disease or from metastasis in internal organs from the first primary growth. For this reason, although these attempts have been carried out for more than two years in more than 50 mice in which experimental tar cancer had been produced, the number in which the second tarring was at all commensurate in duration with the first is still very small. Table I. gives the duration of the first tarring, the interval between the two series of applications, and the duration of the second tarring.

Table I.

Identification number.	Duration of first tarring.	Interval.	Duration of second tarring.
1577	25 weeks	36 weeks	24 weeks
1632	58 ,,	8 ,,	25 ,,
1717	28 ,,	12 ,,	29 ,,

In none of these mice was there any indication of proliferative changes at the secondary site. The hair fell out in the treated area and the skin was found to be atrophic when it was examined in sections. Taken by themselves these observations are without significance, except incidentally for the doubt they throw on the presumed predisposing action of age as increasing the liability to cancer, if no other factor be assumed to operate. The result of a similar trial in mice with spontaneous mammary cancer, however, increases the probability that these negative results are not fortuitous, but due to a real unsusceptibility of the animals to the carcinogenetic action of tar. Table II. gives the duration of the tarring of mice in which spontaneous mammary carcinoma had been removed by operation.

Table II.

A = Identification number. B = Duration of tarring in weeks.

A	B	A	B	A	B
1595	20	1649	20	1758	14 S
1601	23	1655	21	1760	25 S
1620	22	1737	37 S	1777	11 S
1635	17	1755	18 S	1787	8 S
1641	24	1757	9		

Result.—No. 1755 : Metastases in lungs. No. 1787 : Papilloma growing progressively after cessation.

S = Scarification (see context).

In those marked "S" in the column giving the duration of tarring, scarification was combined with the application of tar either for the whole or part of the time. The result after eight weeks in mouse No. 1787 is taken to indicate that the failure to produce any proliferative changes was not due to insufficient duration or intensity of the applications, but indicates a real inability of these animals to respond to this stimulation, carcinogenic for normal animals. (See Fig. 1.)

Another experiment was carried out to see how long the first stimulation must precede the second in order to prevent the development of cancer from the latter. This experiment is still in progress and only the first provisional results in six mice out of 50 tested are available. These 50 mice were painted twice weekly on the left shoulder with the ethereal extract of tar with which most of these experiments have been performed. Seven weeks after the beginning of the tarring, applications were begun on the right flank, unaltered hairy skin intervening between the two areas. The result up to the present is shown in Diagram A.

In two mice carcinomata have developed at both sites and practically simultaneously. In the other four no growth has been produced at the second site, although in all but one which died early, tarring has been kept up for a period, as long as, or longer than was necessary in the first instance.

Some of the peculiarities in the results of anothe experiment, planned originally to show the relativ carcinogenic efficacy of the alcohol soluble, and of th ether soluble fractions of tar in comparison with th unaltered whole tar, bear out this conclusion of general systemic effect of the development of on primary growth, on the liability of the animal t develop another primary growth. The experimen was begun before this possibility had been suspecte Unaltered whole tar, alcoholic extract, and ethere extract of tar were applied simultaneously to separat areas of the dorsal skin of 60 normal mice. Afte four months, when the first tumour appeared, 50 mic survived, and in these 25 presented malignant ne growths distributed as follows :—

Diagram A.

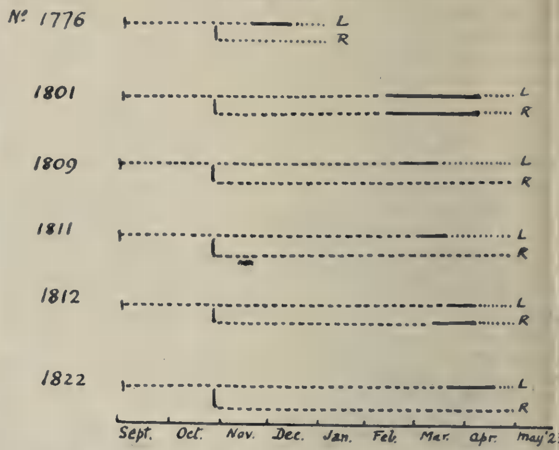


Diagram showing development of carcinomata in six mice painte twice weekly on left shoulder with ethereal extract of ta and seven weeks later also painted on right flank.

Table III.

No. of mice.	Tar.	Alcoholic extract.	Ethereal extract.	
11	–	–	+	22
10	+	–	+	
1	–	+	+	
2	+	–	–	
1	–	+	–	
25				

Twenty-two out of 25 animals bore carcinomata a the site painted with the ethereal extract and in 11 these no tumours developed at the other sites painte Twelve had carcinomata at the site treated with th original tar, and of these ten had growths at the are treated with ethereal extract, two only having n tumours elsewhere. Only two mice developed tumou at the site painted with the alcoholic extract. I one of these (No. 1710, Fig. 4) the ethereal extract als produced a tumour. In the other, only a slight wart thickening appeared at the site treated with th ethereal extract. (Figs. 2 and 3.) While the ethere extract is definitely more certain, it is not mo speedy in its action than unaltered tar. Both pr parations are more active than the alcoholic extra and yet the latter in one mouse alone gave rise to carcinoma. (Figs. 2 and 3.)

This experiment shows that when several su stances of different carcinogenic power are applie simultaneously to separate areas of skin, the resu cannot be predicted with certainty from a knowledge their respective strengths. The relatively weaker whol tar may inhibit for a time the development of th tumour produced by the more active ethereal extrac In one mouse the very much less efficient alcoholi extract had produced a tumour which grew progre sively, while the ethereal extract lesion remaine stationary. Taken in conjunction with the results the retarring of tumour mice already described, thi kperiment, admittedly difficult to interpret, gives dications of a mutual influence of approximately ntemporaneous tumours, by which their full ncerous development is retarded for a time or rmanently. The other experiments show that the duction of a fresh primary growth after a first has en definitely established meets with a very intense sistance, whether the first tumour be of the same rent tissue or another. The nature of this secondary fractoriness to the induction of cancer is obscure. is not a resistance to growth, as is shown by the currence of metastases and the success of autoplasty. is apparently an inability to react with cancerous oliferation to procedures which initiate it with rtainty in normal animals. Nor has it anything in mmon with the well-known acquired resistance to e growth of transplantable tumours. Fibiger has oduced experimental tar cancer in such resistant imals, and the development spontaneously of ammary carcinoma has also been recorded in these -called "immunes."

The nature of this refractory state must be the bject of further investigation. The rarity of ultiple primary malignant new growths in the same dividual finds a rational explanation by it. Its eatest interest and importance, however, lies in the dication it gives of a systemic, constitutional change the organism in which cancer has developed, a ange which, if it could be recognised with certainty d rapidity, would enable us to recognise cancer in its rliest stages, and could we produce it without itiating new growth, would place in our hands a tional means of prevention.

THE IMMEDIATE PROGNOSIS IN NEPHRITIS,

WITH SOME REMARKS ON URÆMIA.

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WITH the increasing application of chemical ethods to the study of the disease, the accuracy of ur prognosis in nephritis has made a considerable dvance. The bulk of modern work has centred ound the question of the retention of the nitro-enous waste products in the blood, and has more pecially concentrated on the content of the blood urea, on account of the ease and accuracy with hich this substance can be estimated. There can e no doubt, however, that an estimation of the rea content of the blood in cases of severe azotæmic ephritis does not necessarily settle the question of e immediate prognosis. A blood-urea content as gh as 300, or even, in rare instances, 400 mg. per 0 c.cm., is not incompatible with recovery in an ute case, and even in chronic types of nephritis, in hich the capacity for recovery is of necessity less, a ood-urea content of 100 to 200 mg. does not necesrily imply a speedy death. A confident prognosis n therefore scarcely be ventured upon from an timation of the blood-urea alone, and several timations at intervals of some days may be ecessary before an opinion on the immediate outlook n be given.

That this difficulty does actually exist in practice shown by the stress laid by certain American thors on the creatinine content of the blood. reatinine is assumed by these workers to be more adily excreted by the kidney than either uric acid urea, and is, therefore, the last of the nitrogenous aste products to accumulate in the blood. On this sumption, any marked creatinine accumulation is be regarded as indicative of very severe renal nctional impairment, and of the terminal stage of e disease. The whole question of the accuracy of e creatinine estimation has, however, been reopened y Benedict,[1] who has even gone to the length of suggesting that practically no creatinine is present in the blood, though he believes that the estimation of the substance, whose chromogenic reactions have led to its confusion with creatinine, is still of value. Folin,[2] also, has come to the conclusion that the retention of the various nitrogenous waste products in the azotæmic type of nephritis proceeds pari passu, and that the suggested delayed retention of creatinine does not actually occur.

A plea may therefore be entered for the value of a determination of the plasma content in inorganic phosphorus (phosphate) in estimating the probable outcome of a case of azotæmic nephritis. The phosphate estimation by the method of Bell and Doisy,[3] as modified by Lehmann, is simple, rapid, and apparently accurate; and, while there is no evidence that the nitrogenous waste products exert any toxic influence upon the organism, phosphate retention is associated with certain definite chemical changes in the blood, which are apparently of importance in the symptomatology of uræmia. The retention of the nitrogenous waste products is a useful guide to the degree of renal damage present, but in itself is apparently harmless; phosphatic retention, on the other hand, appears to involve certain deleterious results.

Though retention of phosphates is undoubtedly associated with impairment of nitrogenous excretion, and though, when a series of cases is averaged, it is found that the rise in the plasma phosphate closely corresponds to the degree of urea retention, in individual cases marked differences in the degree of retention of the two bodies occur. Thus we may find a high blood-urea with a relatively low plasma phosphate content, and conversely. The cause of these differences in the degree of retention of the two bodies is uncertain; the available evidence would appear to suggest that they are the results not so much of variations in excretion as of variations in the diet, and in the demand for phosphorus and nitrogen for anabolic purposes.

Value of Estimation of Inorganic Phosphorus.

The value of the estimation of the inorganic phosphorus in prognosis is illustrated in Table I., in which the figures for blood-urea and plasma phosphorus in 53 consecutive cases of nephritis are tabulated. Where a series of estimations have been made in a patient, the highest figures obtained for the urea and phosphorus are given. In all the fatal cases death resulted from true uræmia. Two cases of nephritis, in which the disease was complicated by peritonitis and by portal pyæmia, and which terminated fatally, have been omitted; in both of these the plasma phosphate content showed no appreciable rise. The normal inorganic phosphorus amounts to between 2 and 4 mg. per 100 c.cm. of plasma.

TABLE I.—*Blood-urea and Plasma Phosphorus in 53 Consecutive Cases of Nephritis.*

Blood-urea mg. per 100 c.cm.	Cases.	Deaths.	Plasma phosphates as mg. P per 100 c.cm.	Cases.	Deaths.
400–566	6	6	10–22	12	12
300–400	3	2	8–9	2	1
200–300	4	3	7–8	2	—
100–200	7	2	6–7	2	—
50–100	7	—	5–6	7	—
Below 50	26	—	Below 5	28	—

The number of fatal cases is small, but the conclusion as to the prognostic value of the phosphate estimation appears to be justified. A sharper line separates the fatal from the non-fatal cases from the standpoint of the plasma phosphorus than from the standpoint of the blood-urea. It is not, of course, suggested that a plasma inorganic phosphorus content exceeding 10 mg. per 100 c.cm. *invariably* implies a speedy death, but merely that as regards the immediate prognosis the degree of phosphate retention is a better guide than the degree of urea retention.

As an illustration of this, Table II. gives the parallel figures for a small number of fatal and non-fatal cases.

Table II.—*Blood-urea and Plasma Phosphorus in 5 Fatal and 5 Non-fatal Cases.*

Fatal.			Non-fatal.	
Urea.	Plasma P.	Length of survival in days.	Urea.	Plasma P.
269	17·5	3	150	5·0
171	15·1	7	196	7·0
198	14·2	3	223	5·6
238	11·6	4	167	6·7
429	12·0	2	267	8·8

Apart from the question of the immediate prognosis, phosphate retention is apparently more definitely connected with the symptoms of true uræmia than is the retention of urea. Cases are occasionally encountered in whom both phosphate and urea retention are present, and in whom the plasma phosphate shows a temporary fall without a corresponding drop in the blood-urea. Under such conditions the symptoms of uræmia may largely disappear during the period of the phosphate fall, in spite of the persistence of a high blood-urea content. Though the weight of experimental evidence would appear to be against the existence of a definitely toxic action of the phosphate ion, its increase in the blood is associated with certain changes in the chemical composition of that fluid which are probably of importance to the organism. The first of these is a reduction in the bicarbonate content of the plasma, often extreme and proportionate to the increase in the plasma phosphate[4]; the second, possibly of more significance, is a reduction of the serum calcium. In the present series the lowest calcium content observed was 5·1 mg. per 100 c.cm. of serum, or about half the normal. The calcium decrease was, on the average, proportional to the increase in the phosphate content of the plasma, and is probably the result of that increase, since experimentally injections of orthophosphoric acid or of phosphates are followed by a decrease in the calcium of the serum. Of ten fatal cases, in which the calcium was estimated, the serum contained less than 7 mg. per 100 c.cm. in nine.

Differentiation of Types of Uræmia.

There can be no doubt that the lines of differentiation between the various types of uræmia originally laid down by Volhard[5] still hold good, though recent investigations have added considerably to our knowledge of the chemical changes present. Volhard distinguished true uræmia from the eclamptic pseudo-uræmia which is seen in acute and subacute diffuse nephritis and also in eclampsia. The symptoms which he regarded as typical of true uræmia are, in brief, weakness and wasting, gastro-intestinal disturbances, liability to infection, motor hyperexcitability, and hyperpnœa. The gastro-intestinal symptoms are not infrequently the only sign of the presence of the disease until the terminal stages are reached. Death occurs from cardiac failure after a period of coma of variable duration. True uræmia is frequently a singularly undramatic condition, and is, in many instances, indistinguishable from the so-called latent uræmia which follows bilateral calculus suppression, or cortical necrosis of the kidneys. There is, in fact, no good reason for distinguishing two conditions which clinically and chemically appear to be identical. As Volhard pointed out, an essential feature of the condition is nitrogenous retention, and to this we can now add phosphate retention, diminution in the plasma bicarbonate, and a fall in the calcium content of the serum. The hyperpnœa may reasonably be ascribed to the acidosis which results from phosphate retention; it is continuous and not paroxysmal, resembling the hyperpnœa of diabetic coma. The characteristic localised muscular twitchings or tremor,
which are a sign of grave prognostic import, appea
to be associated with the diminution in the seru
calcium. Theoretically such a diminution shoul
result in increased nervous irritability, and in m
own experience those cases in which the calcium fa
has been most pronounced have shown this sympto
in its most marked form. The blood pressure ma
be raised, but in a considerable proportion of th
patients lies within normal limits; in the prese
series a case of chronic nephritis, showing a bloo
urea content of 561 mg. per 100 c.cm., gave a systoli
reading of 124 mm. Hg, while in another patie
who gave a history of renal disease of four year
standing, and in whom the blood-urea reached
figure of 269 mg., the systolic blood pressure wa
118 mm. Hg. This absence of any correlatio
between nitrogenous retention and a raised bloo
pressure is now well recognised, and it has been show
that attempts to raise the blood pressure in th
azotæmic type of nephritis by high protein feedin
are without result.

The actual cause of death in this type of uræmi
remains unknown. The available evidence is again
any toxic action of the accumulated nitrogeno
waste products, nor has it been satisfactorily prove
that the phosphate ion is in itself poisonous to th
organism. The effect of the depleted plasma bica
bonate with the resulting tendency to an uncon
pensated acidosis is uncertain; the administratio
of sodium bicarbonate and correction of the defic
in the alkaline reserve of the plasma has, howeve
as in diabetic coma, no definitely beneficial resul
It is possible that the ultimate cardiac failure may
associated with the fall in the serum calcium.

In eclamptic pseudo-uræmia, on the other hand, th
symptoms are more striking, but the prognosis
relatively good. The most prominent symptoms-
headache, vomiting, slow pulse, and generalised co
vulsions—are apparently of cerebral origin. In som
cases temporary amaurosis occurs, and the patie
may lapse into coma without preceding convulsion
The symptoms of the condition, whether occurri
in connexion with acute nephritis or with tr
eclampsia, are the same. The chemical examinatio
reveals few abnormalities. The blood is dilute, th
percentage of serum solids being considerably le
than normal, a condition which is not necessari
present in true uræmia; some degree of chlori
and water retention can be shown to be present b
balance experiments, and œdema, often slight
degree, is present in all cases. In contra-distincti
to true uræmia, the blood-urea content is not appr
ciably increased, and phosphate retention is absent
the alkaline reserve of the plasma, if estimated befo
the occurrence of the convulsions, shows no defini
diminution. The serum-calcium content, at any ra
in cases of true eclampsia, may be at a practicall
normal level; in six eclamptic patients whom I ha
had the opportunity of examining the calcium ha
ranged from 8 to 9·4 mg. per 100 c.cm. of serum
Localised muscular twitchings are absent and th
nervous symptoms are cortical rather than periphera

The most probable explanation of the chief sym
ptoms of the condition would still appear to be th
original suggestion of Volhard, who ascribed th
symptoms of pseudo-uræmia to an increased inte
cranial pressure associated with the raised bloo
pressure and œdema. On lumbar puncture th
intrathecal pressure is abnormally high, the co
vulsions are frequently preceded by a rise in th
blood pressure, and, when once the blood pressu
shows a definite fall, no further fits need be antic
pated. The chief objection to this theory of pseud
uræmia lies in the fact that cases of true eclamps
are said to occur without any definite rise in th
blood pressure. Further investigation of this poi
is highly desirable. Briefly, eclamptic pseudo-uræm
is characterised by cerebral symptoms, in associatio
with some degree of retention of water and chlorid
and a raised blood pressure; nitrogenous and pho
phate retention and the other chemical chang

ical of true uræmia are absent, and in contrast h the latter condition the prognosis in both amptic and nephritic types is good, provided that ath does not result from the convulsions. The imate renal recovery is, as a rule, complete. The ole root of the matter would appear to lie in the ise of the raised blood pressure in the pseudo-emic cases, and of this no satisfactory explanation as yet be given. The rapid changes in the ght of the blood pressure appear to preclude atomical changes in the vessel walls as a factor; e influence of the hydræmic plethora is doubtful, ce marked hydræmia does not necessarily involve rise in the systolic pressure; the most plausible planation would appear to lie in the presence of ne as yet undetermined pressor substance in the culation, but such an explanation is at present re hypothesis. It must even be admitted that we ve, as yet, no definite evidence that the renal ion in these cases is primary. The reported occur-ce of a rise of blood pressure in the eclamptic type pregnancy toxæmia before albumin appears in the ine is of interest in this connexion.

Lastly, in subacute nephritis the two types of æmia may coexist, and this fact has, in the past, l to considerable confusion. In such cases a sed blood pressure, hydræmia, and convulsions are mbined with retention of nitrogenous waste pro- cts and phosphates, and with depletion of the plasma bicarbonate and serum calcium. In such cases the prognosis is of the worst. The condition can only be distinguished from eclamptic pseudo-uræmia by the chemical examination of the blood, which at once reveals the true condition of affairs.

For the sake of clarity, the findings in the three conditions are summarised in Table III.

TABLE III.—*Findings in Three Types of Uræmia.*

	Blood	Plasma.		Serum.		B.P.
—	Urea mg. per 100 c.cm.	Phosphates as mg. P per 100 c.cm.	CO_2 vols. per 100 c.cm.	Calcium mg. per 100 c.cm.	Solids per cent.	Systolic.
Normal	20–30	2–4	60–70	9·6–10·6	9–10	120–130
True uræmia	550	18	24	5·5	9·5	124
Pseudo-uræmia ..	30	3·7	56	9·4	7·1	190
Mixed uræmia ..	270	15	30	6·0	7·5	180

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2. Folin: Physiolog. Reviews, 1922, 2.
3. Bell and Doisy: Jour. Biol. Chem., 1920, xliv., 55.
4. Marriott and Howland: Arch. Int. Med., 1916, xviii., 708.
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SECONDARY ANÆMIA IN INFANCY:

A RECORD OF SOME CLINICAL OBSERVATIONS.

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SECONDARY anæmia has long been recognised as of mmon occurrence in infancy, and undoubtedly sults from many and diverse causes. The present ticle is concerned with the condition seen in a group infants otherwise in good or fairly good health, io were receiving a diet consisting chiefly of cow's ilk, with or without heavy carbohydrate additions.

Milk Diet as a Cause of Anæmia in Infants.

Anæmia in subjects on such diets has been frequently scribed, but opinion as to its cause and symptoma-logy shows wide variation. Milk contains an tremely small amount of iron, a quantity insufficient r the needs of the growing infant (Morse and lbot[1]), and the amount present in cow's milk is obably even less than that in human milk (Finkel-ein[2]). The percentage of iron retained is apparently ss in a baby fed on cow's milk or goat's milk than one fed on human milk (Krasnogorski[3] and auberg[4]), so that the amount of iron obtained from milk diet by a bottle-fed baby does not nearly ffice to meet its needs. Bunge[5] has shown that there in the liver of young animals at birth a store of iron, ich makes good this deficiency in milk during the riod of lactation, and that this store diminishes ogressively in amount during the time of milk eding. In the infant it has been demonstrated that o-thirds of this store of iron is deposited during the st three months of intra-uterine life, so that a emature infant is born with a small store of iron, ough the percentage per kilo body weight is approxi-ately the same as in the full-term child (Hugouenq[6]). emature infants are specially liable to anæmia, and me authors have held that every premature infant d exclusively on milk becomes anæmic, as it is born fore a sufficient amount of iron has been accumulated the liver (Schultness[7]). Many workers claim cellent results from the administration of inorganic on salts by mouth in this condition. Schwarz and osenthal,[8] for instance, say that they are able to ing about an increase of 20–30 per cent. hæmoglobin a few weeks by the administration of iron alone. The majority of writers (e.g., Schultness,[7] Finkelstein[2]), however, advise a restriction of the quantity of milk in the diet and more mixed feeding besides treatment with iron salts. Most of the French authors (e.g., Hallé and Jolly,[9] Leenhardt[10]) consider that the type of anæmia produced in infants by an insufficiency of iron in the diet resembles chlorosis as seen in young adults, and have called it the "chlorotic type" of anæmia in young children.

Certain German authors have differed entirely from these views. Kleinschmidt,[11] after an exhaustive summary of the literature and an examination of his own cases, arrived at the conclusion that the condition resulting from a one-sided milk dietary, which he terms "alimentary anæmia," presents a very varied picture. There are all gradations in the blood between the "chlorotic type" (showing a normal number or slight reduction of red cells, with a diminution in the percentage of hæmoglobin and little other change in the blood) and cases of well-marked von Jaksch's anæmia, with the profound changes in the blood together with the large hard spleen associated with this disease. He, like Czerny, does not favour the administration of iron salts. Both hold that excessive milk consumption plays an important part in anæmia in infants. Czerny believes that the saponification of a large amount of milk fat causes diminution in the alkaline reserve, and Kleinschmidt, while admitting that this view is not yet proved, is nevertheless of opinion that the anæmia is due to some toxic effect produced by the milk in the food. Both successfully treated the condition by greatly reducing the quantities of milk, replacing it by vegetables, cereals, fruit, and, if possible, meat, but very little fat. Kleinschmidt recognises, however, that such a diet contains much more iron than a milk dietary. He holds that "alimentary anæmia" occasionally results from excessive carbohydrate feeding, and attributes this also to a toxic effect. He does not think that anæmia invariably develops from a long-continued and exclusive milk dietary, but believes that its development is favoured by constitutional abnormalities and debility. In a recent publication from the Johns Hopkins Hospital, Evans and Happ[12] set forth evidence in favour of the view that secondary anæmia in infancy from a single cause may lead to a variety of blood pictures, the grade of change depending on the degree of strain thrown upon the blood-forming mechanism. So that they agree with Kleinschmidt that there is no clear line of demarcation between the "chlorotic" of anæmia of infancy of the French writers and other forms of secondary anæmia, among which they include splenic anæmia of infancy (von Jaksch's anæmia). It is clear, therefore, that opinions have differed greatly as to the cause, symptomatology, and treatment of anæmia occurring in infants given an exclusive milk dietary.

The Normal Blood Count in Infancy.

Different authorities, moreover, are not agreed concerning the normal blood count in infancy, especially with regard to the percentage of hæmoglobin. Holt's figures[13] for infancy represent views commonly held. Exclusive of the first few days of life, they are: Hæmoglobin, 65–85 per cent. ("75 per cent. a low limit in healthy children"); red blood corpuscles, 4–5½ million per c.mm.; white blood corpuscles, 9000–18,000 per c.mm. Finkelstein[2] puts the lower limit of hæmoglobin at 65 per cent.; Kleinschmidt[11] explains the differences of opinion concerning the range of the normal hæmoglobin percentage in infancy as largely due to the differing standard colour tubes used. It would seem that such a figure as 55 per cent. for the lower limit of normal (Aschenheim) must be due to the use of a standard colour tube differing considerably from those used by most workers. Many authorities place the normal red-cell count higher than does Holt—i.e., at 5 million or more per c.mm. (Kleinschmidt[11]).

Personal Observations.

The following observations are published because they demonstrate the extreme frequency of anæmia on cow's milk diets in a group of children living under excellent hygienic conditions. The results came as a surprise to me, and may, perhaps, be of use to others. The observations were made at the Meidling Hospital, Vienna, an institution under the charge of Dr. Egon Rach, and under the direction of Prof. Pirquet, head of the University Kinderklinik. The infants were admitted for an investigation concerned with the prophylaxis and cure of infantile rickets.*

(1) *Diets and Hygienic Condition.*—Two types of diet were in use. One was that in general use in the institution. It consisted of cow's milk with heavy carbohydrate additions. An infant until about 5 months of age was given full milk with the addition of 8·5–20 per cent. of cane sugar. From about 5 months old it received also increasing amounts of cereal, and at about 6 or 7 months small amounts of vegetable purée, usually potato, sometimes carrots or spinach. Fruit purée was usually given at about 8 months, biscuits about 9 months, bread between 9 and 12 months, and butter not till after 12 months. Eggs were given to a few of the older children. The total calorie allowance was high, and the amount of milk consumed daily at 5 months of age was usually over 1 pint. For older infants it was not less than this amount, and was usually nearer 1½ pints.

The other type of diet was a more exclusive milk dietary, so that larger quantities of milk were consumed. It consisted of milk (dried milk was used), with small additions of cod-liver oil. The total calorie allowance was somewhat smaller than in the case of infants on the first type of diet. The quantity of milk was often 1¼–1½ pints at 5 months of age, and older infants occasionally received nearly 2 pints daily for short periods. Before 8–9 months of age little or no added carbohydrate was given. All children on both diets received additional antiscorbutic diet daily, from the time of admission, in the form of orange juice, tomato juice, or swede juice. The infants lived in well-lighted, airy wards. During the summer they were much out of doors, but during the cold Austrian winter they were indoors for weeks at a time.

(2) *Number and General Condition of Infants.*—The records include 36 infants. Twenty-five of the children were admitted under 3 months of age; at the time of the last observation, their age varied from 5½–21 months, 23 being over 9 months. The time in hospital varied from 4½ to 15 months. Three ha rickets on admission, and nearly all were under weig at that time, but they were not suffering from acu illnesses. On the whole the level of general heal was fairly satisfactory during the period of observatio though there were many minor intercurrent illnesse such as colds in the head and otorrhœa. Six infan on the first type of diet developed radiograph evidence of rickets in the winter.

(3) *Percentage of Hæmoglobin.*—Approximately 2 hæmoglobin estimations were made with Haldane hæmoglobinometer from blood collected from a pri in the heel; unfortunately they were not done regular intervals, as their purpose at first w merely the comparison of infants on the two types diet. In only three infants of this series was complete blood count made—in these cases the r count was over 5,000,000 per c.mm. on every occasio but there was a low hæmoglobin reading of 50 per cen or less, and consequently a colour index of less tha 0·5. The leucocyte count was 12,000–18,000 p c.mm., and the differential count was normal. The was slight polychromatophilia and poikilocytosis. other words, there was marked anæmia of the so-call "chlorotic type."

Towards the end of the first year of life the majori of cases showed a drop in hæmoglobin, and 23 of t 36 infants had at some time less than 65 per cen of hæmoglobin. Of 15 infants who were in hospit after 12 months of age, 14 developed a hæm globin percentage of 39–65 per cent., and of infants in hospital after 9 months of age, 20 had some time less than 65 per cent. of hæmoglobi and 10 less than 55 per cent. Anæmia was general first noticed between 9 and 12 months of age, but several cases was well marked (50 per cent. to per cent. of hæmoglobin) between 6 and 9 months age. In only one child under 6 months of age was t hæmoglobin percentage under 65 per cent. This w a sickly, newly-admitted infant of 2 months, and t hæmoglobin percentage by 5 months of age had rise with improvement in the general health, to 82 per cen

These figures indicate that nearly all infants fed the types of diet described developed anæmia at t end of the first year of life, in spite of good hygien conditions and in many cases in spite of good gener health. A number of infants, notwithstanding t low hæmoglobin content of their blood and th striking pallor, appeared to feel remarkably well a were extremely active. From the numbers observ there was no evidence that anæmia was more mark among infants on one type of diet than among tho on the other, although one group of infants receiv cereal and vegetable additions to their dietary earli than the other group. Possibly a larger number cases might have revealed some difference. Eg (½–1 daily), given for 3 to 5 months to a few infant appeared to exercise no influence on the degree of t anæmia. Nor was the anæmia particularly associat with rickets; some cases who developed slight ricke had no anæmia, and in a case with no clinical radiographic evidence of rickets the hæmoglobin fell low as 39 per cent. There was no clear associati between anæmia and so-called exudative diathe (cf. Kleinschmidt[11]), nor with splenic enlargeme Only one of these cases had a definitely enlarg spleen, and in that case the degree of anæmia w slight. Cases with anæmia showed no tenden towards spontaneous recovery. There was in wint a progressive fall in the amount of hæmoglobin aft the condition had developed. Outdoor life a summer conditions, with the resultant improveme in general health, did not bring about improvement the blood condition in a single case in which anæm had occurred, but in some cases the condition seem to have been arrested.

(4) *Treatment.*—The form of treatment given w the administration of iron salts by mouth. T preparation used was ferri carb. sacch., 4½–9 gr. dail The doses were given in the food and caused digestive disturbance. Twelve infants received t treatment for from 1½–3 months, and seven show

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* See Studies of Rickets in Vienna, 1919–22, Medical Research Council, Special Report Series No. 77. A preliminary report of these investigations was published in The Lancet, 1922, ii., 7.

good response with increase of 14–38 per cent. of æmoglobin, and were discharged with 64–77 per cent. hæmoglobin. Improvement was not noted in any se until 3–4 weeks after treatment was begun, and one case in which the percentage of hæmoglobin creased from 49–71 per cent. in 2¾ months no nprovement was noted in the first six weeks of eatment. It is clear, therefore, that to give iron eatment a fair trial one must persist with it for a umber of weeks. Of the remaining five cases, three nowed an increase of hæmoglobin of 6–10 per cent., nd were improving at the time of discharge, and two nowed no improvement after 1½–1¾ months' treatent. Several of these five had been handicapped uring the period of treatment by other causes, ne had an operation for the removal of tonsils and lenoids, one had a pyrexial attack with tonsillitis nd otorrhœa, and one was suffering from an X ray urn—the result of a previous unsuccessful attempt to eat the anæmia by radiation of the spleen. If the eriod of treatment had been longer, there is little oubt that further improvement could have been btained in the majority of cases. Finkelstein[2] holds hat at least three months' treatment should be given every case, and says that there is no improvement the hæmoglobin percentage in the first few weeks fter the beginning of a course of iron treatment. one of the cases under consideration was treated by reduction of the quantity of milk in the diet, so that o opinion can be offered as to this method of treatent. But the advocates of strictly dietetic treatent state that the complete change in diet is usually ccompanied by a loss of weight, and often results in a fusal of food and a digestive upset (Kleinschmidt[11]), that if the same object can be attained by the dministration of iron without any untoward effects, ere is no doubt that the latter would be the treatment be preferred.

Prophylaxis.

More important than the question of treatment is hat of prevention. The evidence available, in the pinion of the author, strongly supports the view that e anæmia is the result, in part at least, of iron arvation, but what other factor or factors play a art in its production is as yet uncertain. Milk conins very little iron ; the infant is dependent on the tore in its liver, and it has been shown that this store very low by the end of the normal period of lactation Bunge[5]). Thus, if the store is used too quickly, the hild may well suffer from an insufficiency of iron uring the first year of life, and this is likely to appen in an infant fed from an early age on cow's ilk on account of the smaller percentage retention of on in an artificially-fed child.

Attempts to produce anæmia in young animals by iving diets containing insufficient iron have not given onsistent results (Kleinschmidt,[11] Hausermann,[14] chmidt[15]), but have usually resulted in marked næmia. In view of the recent advances in the echnique of dietetic experiments on animals, much of he work of earlier writers appears now of lessened alue, but the recent work of Happ[16] on young rats ndicates that a diet containing insufficient iron r for that matter a diet of cow's milk or cow's milk nd bread) will not produce anæmia in these animals the first generation, but that it may occur in the econd generation. Possibly, therefore, an insuffiiency of iron is only one factor producing "alimentary næmia" in infants. Nevertheless, if iron starvation lays a part in such anæmias, the question of how the eficiency of iron in the diet is to be supplemented, nd from what age this should be done, requires onsideration. Finkelstein advocates the adminisration of fruit juice and vegetables from an early ge—to premature infants from 4–5 months of age— ut states that such a diet will not necessarily prevent næmia in premature babies. Kleinschmidt is mphatic that mere supplementing of a milk diet with egetables without marked reduction in the quantity f milk will not cure the anæmia. Small daily rations f vegetables given to many of the children at the Ieidling Hospital from the age of 6 or 7 months did not prevent anæmia, and the giving of eggs to older babies appeared to have no beneficial effect on the amount of hæmoglobin. No evidence was obtained as to whether or not supplementing the milk dietary with any other foodstuff, for instance gravy or meat juice, would have proved prophylactic. In any case, it seems highly desirable that the question of prophylaxis should be further studied, and this the author hopes to have the opportunity of doing in the near future.

Most medical officers in charge of infant welfare centres must have been struck by the number of pale-faced babies attending. What proportion of these are truly anæmic can only be ascertained by examination of the blood, but the number must often be large. No doubt many of these anæmias are not primarily dietetic in origin, but if, as seems probable, one frequent cause is iron starvation, it would appear advisable to administer some form of iron salts as a drug to all such cases at an early stage, whether or not other treatment is given.

Summary.

1. There is a general consensus of opinion that too prolonged and too exclusive a milk dietary produces anæmia in infants and young children. This is probably due in part at least to iron starvation, on account of the low iron content of milk. Some writers, however, have held that it is directly connected with a toxic effect resulting from excessive milk consumption. Premature infants are known to be particularly liable to this form of anæmia.
2. In a group of 36 artificially-fed infants, receiving milk or milk and carbohydrate diets, with or without cod-liver oil, the majority developed anæmia. It was usually noted towards the end of the first year of life, but sometimes appeared as early as the seventh month. Additions of vegetables to the diet from 6 or 7 months old did not prevent anæmia. The infants were in well-lighted and well-ventilated wards, and were much out of doors in summer but very little in winter.
3. Treatment by the administration of inorganic iron salts by mouth brought about improvement in the majority of cases treated, but not in all, possibly because treatment was not continued for a sufficient length of time.
4. No improvement was noted in the hæmoglobin content of the blood in any case within three to four weeks from the beginning of treatment, and improvement might be delayed for six weeks with, thereafter, rapid progress.
5. It is suggested that many cases of anæmia in infants, particularly in those artificially fed from an early age, are probably associated with iron starvation, more especially as it has been experimentally demonstrated that the iron retention of an infant on cow's or goat's milk is much lower than on human milk.

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Reviews and Notices of Books.

A Text-Book of Therapeutics.

Including the Essentials of Pharmacology and Materia Medica. Sixth edition. By A. A. Stevens, A.M., M.D., Professor of Applied Therapeutics in the University of Pennsylvania, Philadelphia; Visiting Physician to the University and the Philadelphia General Hospitals. London and Philadelphia: W. B. Saunders Company. 1923. Pp. 793. 30*s*.

This book is one which deserves to be better known in this country amongst students who have attained to house appointments and amongst all actively engaged in the practice of medicine. Of the books on treatment at present available which are at once comprehensive, up-to-date, and discriminating, it is one of the best we have met. It is divided into two parts, of which the first deals with the various therapeutic agents, their pharmacological action and method of application; the second part, occupying the last 250 pages, is a compact survey of the treatment of most acute and chronic diseases. A prominent feature is the inclusion of numerous prescriptions and a discussion of incompatible substances. In addition to the various pharmacopœial preparations mentioned, useful attention is given to a consideration of the better known proprietary preparations. The chief merit of the book, however, lies in its exposition of modern methods. There is a good account of C. Eggleston's views on the value of administering large doses of digitalis, and of the indications for and against the use of quinidine in heart disease; of Schleich's method of infiltration anæsthesia with local anæsthetics; of the Schick test and of Park's results with toxin-antitoxin mixtures in immunisation against diphtheria; of the treatment of amœbic dysentery with emetine-bismuth-iodide by the mouth; of Chandler Walker's method of treating bronchial asthma with specific proteins; of the Allen treatment of diabetes, which includes a table giving the protein, fat, and carbohydrate percentages in ordinary foods; of the Sippy treatment of gastric ulcer. Chapters, written with judgment and restraint, are devoted to electrical treatment, massage, the Nauheim treatment for chronic heart disease, X ray and radium therapy and the Finsen-light treatment. Turkish and Russian baths, hot packs, hypodermoclysis and gastric lavage are discussed.

A book of this kind should obviously be of great value, presenting as it does within one volume a critical account of so many matters otherwise only available in scattered papers.

There is surprisingly little to which exception can be taken. There is no mention of the treatment of tuberculosis by heliotherapy in climates where the high cooling power of the air makes prolonged exposure to sunlight possible; indeed, Prof. Stevens thinks that sanatorium treatment has been shown to be equally successful in all climates. The work done in this country during the war on the treatment of shock has hardly received adequate attention. While Bayliss's gum-saline is described in the chapter on infusion and hypodermoclysis, the author has nothing better to advise for shock than adrenalin and pituitary extract. Unless A. Krogh's recent work on the frog is to be taken as such an indication, there is as yet no evidence whatever that pituitary extract is of the slightest value in shock treatment; the defect one of the capillary circulation which pituita extract does not influence. Perhaps a more seriou error occurs in reference to the use of pituitary extra in labour. Prof. Stevens states that when the os fully dilated, in cases of uterine inertia, 0·5 c.cm. pituitary extract may be given. It is not sufficient realised how potent this remedy is, and text-boo statements of this kind, if followed up, are bound produce the opinion that the extract is dangerous for such a dose is two or three times too great. Dos of from 0·1 c.cm. to 0·2 c.cm. of the ordinary 10 p cent. extract are amply sufficient for administr tion in the second or first stage; ignorance this important point has led many conscientio obstetricians to neglect the valuable aid pituita extract can give.

A dozen such criticisms, however, leave the ma excellence of the book unimpaired; such points a inevitable when the net is cast so wide. The auth is to be congratulated on having on so many sides a with so much judgment succeeded in presenting su an excellent work in the limits of one volume.

Multiple Sclerosis (Disseminated Sclerosis).

Being Vol. II. of the Series of Investigations a Reports of the Association for Research in Nervo and Mental Diseases. New York: Paul Hoeber. 1922. Pp. 241. $3.75.

If the report on disseminated sclerosis by numero distinguished American investigators does not y solve the problem of the disease, it brings us somewh nearer that desirable end. The reader familiar wi the subject naturally turns to the sections deali with the nature and ætiology of the affection, on to find that the Commission declares it extreme difficult to decide whether the disease is inflammato or degenerative; in fact, they admit frankly th have not reached a conclusion on the question of t existence of acute multiple sclerosis as distinct fro encephalitis or lues. They cannot regard the problem a possible micro-organismal origin as either confirm or unsubstantiated on histological grounds. It mig appear as if we are farther off than ever from t solution of a common and widespread organic nervo disease. What is of value in this report, howev is the collation of an immense amount of data reference to the geographical distribution, inciden frequency, racial apportionment, and general æti logical factors of multiple sclerosis; the setting of t problem, we may say, is rendered more distin thereby. The chapter on general and speci symptomatology apparently omits any reference the interesting group in which epilepsy is an earl sometimes the very first, symptom of the disea There is an excellent bibliography, but the volume sorely in need of an index.

The Common Neuroses: Their Treatment Psychotherapy.

By T. A. Ross, M.D., F.R.C.P.E., Medical Direct Cassel Hospital for Functional Nervous Disorde London: Edward Arnold and Co. 1923. Pp. 2 12*s*. 6*d*.

Dr. Ross opens by a survey of the many fashio that have come and gone in the theories and tre ment of the neuroses—the exhaustion theory, wi its rest cure, the "reflex" theory with treatm directed to the uterus, to minor refractive errors, nasal spurs and deflections or to "dropped kidney and the still current toxic theory—and decides th enthusiastic if short-lived belief was the agent th removed symptoms. Drawing almost entirely up his own experiences, of which 17 years were spe in general practice—a source of ample material the study of neuroses—he demonstrates the psych genic nature of these conditions and provides copio illustrations of his methods of treating them. relies upon analysis, explanation, and persuasi mbined or as alternatives, and the frank accounts his own difficulties and failures, together with a strained tone throughout the book, are a welcome ntrast to those optimistic writings upon psycho- erapy which raise the suspicion that here, too, we ay have only another phase of enthusiastic belief. s attitude towards psycho-analysis is not well defined. the preface he takes the view, scarcely justified by retrospective glance, that ten years ago the spell Freud was so potent that the writings of Dejerine re unduly handicapped. Giving full credit to eud's work and making free use of his methods, he ploys the strange phrase, concerning the taking of history, that " there is no taint of psycho-analysis out it " (p. 112). It is perhaps fear of this taint at makes him skim lightly over difficult problems. xual impotence, for example, cannot always be noved by reassurance, and the marriage of an potent man, which he would allow (p. 110), is often lowed by unhappy results; sexual frigidity in men, an equally potent source of unhappiness, or rse, is not mentioned. Dr. Ross's handling of the mpulsion neurosis is weak, in both the treatment d the symptomatology of this important and often recognised condition. He shares the view, which ssibly had origin in a mis-translation in an American ition of Freud's " Introductory Lectures," that alysis is contra-indicated in this neurosis, and scribes his own failure in a patient of 49, who was hysically and psychologically a rather old man "; v psycho-analysts would have attempted the task a patient of that age and type, but analysts claim st satisfactory results in properly selected obses- nal cases, and Dr. Ross, in quoting Jelliffe, gives e unfortunate impression that the gloomy prognosis orthodox.

These weak points, however, detract but little from e usefulness of the book to the general practitioner, whom it is written and to whom it may be cordially ommended.

EDICAL DIAGNOSIS.

Fifth edition. By CHARLES LYMAN GREENE, M.D., formerly Professor of Medicine, University of Minnesota and Chief of Medical Clinic in the University Hospitals. London: William Heinemann. 1922. Pp. 1453. 63*s*.

THE new edition of this work contains 75 new illus- tions and an additional 150 pages. More than half the new matter is included in the section dealing th disorders of the heart and blood-vessels to which of. Green devotes particular attention, the many similes of electro-cardiograms being very valuable. e doubt whether all readers will agree with his narks on " drop heart," and feel that auricular tter should be included in the classified list of hythmias on p. 543, but otherwise we find s section illuminating. The vast amount of ormation in the book is made readily accessible by e excellence of the indices as well as by the provision each page of a margin containing terse epitomes. e author's descriptions of the latest tests and aids diagnosis, and his reasoned and moderate view of ir individual value enhance the value of the work ich, if too comprehensive for students, forms an ellent text-book of diagnosis.

STOSCOPY AND URETERIC CATHETERISATION.

Traité pratique de cystoscopie et de cathétérisme urétéral. Second edition. By G. MARION, Professeur agrégé à la Faculté, Chirurgien de l'Hôpital Lariboisière (service civile); and M. HEITZ-BOYER, Professeur agrégé des voies urinaires à la Faculté, Chirurgien de l'Hôpital Saint-Louis. Paris: Masson et Cie. 1923. Pp. 480. Fr.100.

IN the second edition of their book on Cystoscopy I. Marion and Heitz-Boyer have not changed general arrangement of the work. They have, wever, entirely rewritten the chapter dealing with optical principles involved and with the interpretation of images; and they have now given less space to the discussion of direct and indirect (or reversed) images, for as they justly remark, urinary surgeons should be equally conversant with both methods. One chapter is new and deals with urethrocystoscopy as first described by Buerger. Many additions have been made in the chapters on pyelography, the estimation of renal efficiency, and cystoscopic operations. It is of interest to note that these surgeons prefer the high-frequency spark to the diathermy current as employed in this country, believing that the former is more exact and more easily controlled.

The second edition should appeal to an even larger number of the profession than the first. It is admirably written, and has the advantage of being based on the personal experiences of two well-known genito-urinary surgeons. It contains in all 60 plates, mostly in colours, of cystoscopic findings, described in no less than five languages.

SELECTED PAPERS AND ADDRESSES.

By WILLIAM WILLIAMS KEEN, M.D., LL.D., Emeritus Professor of Surgery, Jefferson Medical College of Philadelphia. Philadelphia: George W. Jacobs and Co. 1923. Pp. 340.

PROF. KEEN is well known on this side of the Atlantic as the doyen of surgery in the United States, and his book shows that he can write lucid and literary English with something of that indefinable quality which pervades the writing of John Brown of the " Horæ Subsecivæ." The papers and addresses were written at various times and upon different occasions, and therefore, as Prof. Keen implies in his preface, are not necessarily to be taken as setting forth the present-day opinions of their author. Some of them, however, deal with matters which are as permanent as anything can be in this world of flux, as, for instance, the paper upon the conditions of surgery before and after Lister; that upon the benefits not only to human beings, but also to the lower animals derived from experiments upon animals; and that entitled " Things Surgeons Stand For."

Other papers deal with the Service of Missions and with the impossibility of a war between Great Britain and the United States. Altogether the collection is a satisfying one which should be read and pondered not only by medical men, but by all who have the welfare of humanity at heart.

GENERALISED PAIN.

Being Part II. of the Clinical Symptomatology of Internal Diseases. By Prof. Dr. NORBERT ORTNER, Vienna. Authorised translation by FRANCIS J. REBMAN. With an introduction by THOMAS WEBSTER EDGAR, M.D., New York. New York: Medical Art Agency. 1922. Pp. 596.

TO analyse and describe all the varieties and causes of pain in the body generally, from scalp to toes, is an ambitious project; to carry it out with any degree of success is matter for congratulation. We think Prof. Ortner has reason to pride himself on the attainment of his object, for only a physician with some knowledge of all the specialties can possibly hope to accomplish the task in anything like an adequate fashion. Pain in the heart, back, neck, shoulder, chest, head, muscles, bones, joints, and extremities demands for its investigation the erudition of a universal specialist, if such there be. We have scanned these pages with pleasure and profit, and are amazed at the range of clinical knowledge of their author. No one can quarry into this material without finding something with which he was not familiar. We can hardly compliment the translator on his style, though in an introduction the reader is assured that clear and simple English has been chosen. Apart from a large number of misprints, misspellings, and mistakes (" a wattling gait," " plyocytosis," " parosnia " and " pareugesia," " ischimia," " Bamberg's phenomenon in tabes," "motoric aphesia," &c.), we regret that the author's meaning should thus suffer in careless translation: "diseases of the brain occupy the area of the trigeminal nerve which is the original habitat of paræsthesias" (p. 281); "I do not refer to the sensible aura of epilepsy" (p. 330); "bitemporal contraction of the face (hemianopsia)" (p. 287), &c. The English rendering becomes ridiculous when we are told that varicose veins cause "edema of the knuckle." Many unfamiliar expressions—"Wolhynian fever," "Sudek's atrophy," "Pappataci fever," "malum Rustii," "Bruck's disease," "Jack's disease" (can this be von Jaksch's disease?), "pyrgocephalus," &c. occur. For those, however, to whom the original is not accessible even an indifferent translation will be acceptable.

SURGICAL DIAGNOSIS.

Exploration clinique et diagnostic chirurgical. By FELIX LEJARS, Professeur de Clinique Chirurgicale à la Faculté de Médecine de Paris; Chirurgien de l'Hôpital Saint-Antoine; Ancien Président de la Société de Chirurgie. Paris: Masson et Cie. 1923. Pp. 778. Fr.60.

IT is a charge frequently levelled at the present generation that its powers of diagnosis are vastly inferior to those of its forefathers. The charge can be easily answered, but no one denies that there exists room for improvement in this most difficult department of medical science. None will gainsay the existence of "clinical instinct," but this does not imply that diagnostic ability may not be acquired. How then may it be taught? We believe that an exhaustive, exact, and intelligent examination of the patient, combined with a judicial review of the history, will enable the student often to make accurate diagnoses, without having continual resort to multiple laboratory tests. It is for this reason that we welcome this book.

Prof. Lejars has set himself to describe a precise technique for the examination of every kind of pathological condition in every part of the body. He has succeeded in so doing in a concise manner, and has been aided in making his meaning easily understood by a very large number of illustrations. The style in which the book is written may not appeal to some in this country, and the reproductions of the X ray photographs are in most cases poor, but there can be no doubt that it is a book of great value and should appeal to a wide circle.

THE EVOLUTION OF MAN.

A Series of Lectures delivered before the Yale Chapter of the Sigma Xi during the Academic Year 1921–22. Edited by GEORGE ALFRED BAITSELL. London: Humphry Milford, Oxford University Press; New Haven: Yale University Press. 1923. Pp. 202. 15*s*.

THERE are six lectures included in this book, with a bibliography and index. The subjects of the lectures are the Antiquity of Man, the Natural History of Man, the Evolution of the Nervous System of Man, the Evolution of Intelligence, Societal Evolution, and the Trend of Evolution. The authoritative nature of the statements made is assured from the names of the collaborators, Profs. R. S. Lull, H. B. Ferris, G. H. Parker, A. G. Keller, E. G. Conklin, and President J. R. Angell. It is evident that the book is not intended for specialists in the various departments with which it deals, but rather for those others who desire acquaintance with what is being thought and said in the biological world and laboratories. We have read the book with very great pleasure, for the lectures are not only authoritative but are phrased in clear and simple language. The earlier lectures are clearly illustrated. We can heartily recommend this work to the medical man who has little time to spare but wishes to know how matters evolutionary stand to-day. The volume is handy and well produced.

SURGICAL ANATOMY OF EMERGENCY OPERATIONS.

Topographische Anatomie dringlicher Operatione Second edition. By J. TANDLER. Berlin: Juli Springer. 1923. Pp. 118. 8*s*. 4*d*.

IN this book the surgical anatomy of emergen operations is considered and the steps of each procedu set forth. The descriptions are clear and the many ve beautiful illustrations self-explanatory. In a bo devoted to anatomy only one naturally looks for account of variations in the typical relations of t structures in the gastro-hepatic omentum, a subje of great importance to the surgeon. But this does n appear, probably because the author is an anatomi and not a surgeon. The latter gets the impression operations that the cystic artery rather more common passes behind than in front of the common bile-du as depicted on p. 67. By a printer's error, t structures shown in Fig. 54 have been wrongly labell The oblique lumbar incision for exposing the kidn is described, but when, in an emergency, a bilate nephrotomy or decapsulation has to be perform the Mayo approach, which is not mentioned, is simp and quicker.

VISCEROPTOSIS.

Les désanglés du ventre; Maladies par reläch ment des parois et organes abdominaux. By I CHAUVOIS. Paris: A. Maloine et Fils. 19 Pp. 167.

IN this little book Dr. Chauvois described t varieties and results of atony of the abdominal w with its effects on the abdominal viscera. T illustrations are an important part of the wo being for the most part arranged in pairs to sh the clinical types under discussion side by side wi types of healthy and well-built subjects. Full rec nition is given to the writings of Glènard, and t author has made no attempt to cover every asp of his subject; technicalities are avoided, for I Chauvois appeals not only to medical men, but a to lay people, and especially parents. With t object, in the chapters on treatment the great prominence is given to the early stages of the d ability and to its prevention, particularly in chi hood. Methods of general hygiene, and the val of correct abdominal supports, fresh air, bat athletics, and special breathing and gymnas exercises are described. In England we have be rather in advance of France in these matters, abdominal atony is only too common, and this bo is of considerable educational value; its m practical defect is that insufficient attention directed to the importance of looking for and era cating any focus of sepsis, in children especially, this is the primary cause of the lethargic habit very many cases.

SURGERY.

Grundriss der gesamten Chirurgie. Second editi By Prof. Dr. ERICH SONNTAG, Vorstand Chirurgisch-poliklinischen Instituts der Universit Leipzig. Berlin: Julius Springer. 1923. Pp. 9 11*s*. 8*d*.

THIS book is written in the form of a synopsis general surgery. It is well arranged and classif under suitable headings for the various systems, could be used by students as a "crammer" revision before examinations, or by the practitio for reference in times of emergency. To literary st it makes no pretence, and it confines itself to orthodox teaching of the day, without attempting present or to solve any of the numerous controver with which modern surgery abounds. The book inclu a short chapter on operative surgery, which, w necessary for the completion of the work, is almost short and sketchy to be of much practical value, m especially as it lacks illustrations. The fact tha second edition has appeared is sufficient evidence t the book is in demand and fills a definite place in literature of its kind.

SIXTH CONGRESS OF THE INTERNATIONAL SOCIETY OF SURGERY.

(Concluded from p. 147.)

Wednesday, July 18th.

Arthroplasty.

Mr. E. W. Hey Groves (Bristol) defined arthroplasty an operative procedure upon an ankylosed joint th the object of restoring mobility. The pseudothrosis occasionally resulting from an ununited acture proved that the formation of a new joint th adapted articular surfaces and a capsule and novia was within the powers of nature, yet the sults of attempts to form a new joint by operation re variable and not always successful. Mobilisation the elbow by some form of operation was usually ccessful, while arthroplasty of the hip and knee s frequently disappointing. The conditions most vourable to arthroplasty were bony ankylosis due trauma or long cured pyæmia and occasional cases osteo-arthritis and tubercle. The essential operave procedure in arthroplasty was the making of a p between the articular ends, which gap must be aintained until healing took place; shaping and vering the articular ends was useful but not essential. ntinuous traction on the new articulation and early luntary movement were most necessary in aftereatment. In the elbow the suitable cases were ose of bony ankylosis free from active infection, cept those in which a strong useful arm was present a labouring man. He considered that the best eration for the elbow was to preserve the whole dth of the humeral condyles and to cover this bone th a free flap of fascia lata. In the hip there were ree different types of operation to be considered: For simple ankylosis an osteotomy of the neck the femur with interposition of a flap taken from e fascia or from the capsule; (2) for massive pertrophic ankylosis, a subtrochanteric osteotomy th the interposition of a fascial flap, forming a ddle-shaped joint; (3) for osteo-arthritis, excision the head of the femur. In the knee any operation s unjustified if the joint were fixed in a good posin, and it was only in the case of ankylosis of both ees that arthroplasty should be considered. The sential points in any such operation were the use of e fascia to cover the lower end of the femur, e preservation of the lateral ligaments, and the e of a jointed knee-cage for some months afterrds. If lateral mobility persisted, then the eral ligaments must be reinforced by a second eration.

Prof. V. Putti (Bologna) gave his experiences thered from 142 arthroplasties, the first of which s performed 10 years ago. He pointed out that throplasty was a severe and traumatising operation, d depended much for its success upon the coöperan of the patient in the after-treatment. It should erefore be reserved for patients of good vitality tween 20 and 50 years of age, whose mental condition s good in that they were neither hypersensitive nor uropathic. The profession of the patient was also portant; in certain callings strength was preferable movement. Bony ankylosis gave better results an fibrous; the ankylosis following acute infective hritis (especially when the result of war wounds), lyarticular arthritis and certain cases of osteohritis of the hip, and, rarely, of tuberculous arthritis re indications for arthroplasty. Operation should t be performed until after the lapse of a year from time of the last acute manifestations. Ankylosis the temporo-maxillary joint, bilateral ankylosis the hip-joints, and ankylosis of the elbow in extenn were all absolute indications. In the knee ually good results could be obtained as in the ow. The operation consisted essentially of the rtial resection of the joint which should be neither extensive nor too sparing, and the exact fitting of the articular surfaces by means of gouges and files. The raw bony surfaces were then covered by free flaps of fascia lata, sewn into position, and the joint reconstructed by careful suture of the muscles, &c. Extension was kept upon the joint after the operation, and free use was made of active hyperæmia induced by radiant heat. Movements were begun by the patient in 12 to 15 days. After arthroplasty of the lower limb the patient should be able to walk within a month. The new joint was gradually and slowly developed as the result of use; the action of the flaps of fascia lata was merely temporary, but they were very helpful in the early stages. He had occasionally found it necessary to open one of these new joints some years after arthroplasty, when he found a condition strongly resembling the normal articulation. Movement was painless, and tended to increase with time rather than to decrease; the new joints were not affected by osteo-arthritis, but remained functionally good after many years of use. After delivering his report Prof. Putti showed cinematographic records of arthroplasty of the knee, showing all the details of the operation, the after-treatment, and the results. He concluded by exhibiting four cases in whom he had performed arthroplasty of the knee for bony ankylosis following war injuries. All four had a range of at least 90° of flexion from full extension (without undue lateral movement) and walked normally; it is worthy of remark that all were still serving in the Italian Army and doing full duty, two of them as officers.

Dr. W. R. MacAusland (Boston, U.S.A.) discussed the present position of arthroplasty, and pointed out in what respects it differed from mobilising excision. After a brief reference to the pioneer work of Baer, who used chromicised pig's bladder for interposition, and of the late J. B. Murphy, who developed the use of a pedunculated fat flap for the same purpose, he described the use of free fascia lata flaps after the method of Putti and Peyr, which had given the most uniformly successful results. Dr. MacAusland's report was lavishly illustrated with drawings and photographs, showing the technique and results of arthroplasty in the various joints in which he had found the operation of arthroplasty useful, notably the elbow-, hip-, and knee-joints, and cinematograph pictures were shown at the meeting of the operation of arthroplasty upon the elbow-joint. Access was gained to the joint by severing the olecranon process, and the remaining details of the operation resembled those of Prof. Putti's arthroplasty of the knee, except that only one bony surface (that of the humerus) was covered by the fascia lata flap. As a result of the operation, about 100° of movement could be obtained; in the earlier cases this was from full extension, but more recently he aimed at a range of from 45° to 145° (full extension = 180°), which he considered more useful. In considering the indications for arthroplasty, the speaker agreed broadly with those who preceded him, but he laid special emphasis upon the necessity for reserving arthroplasty for joints in which the muscles were still in good condition. The joints which gave the best results were the elbow, hip, and knee.

Dr. P. Santy's (Lyons) contribution was read by Dr. R. Leriche. Dr. Santy said that surgical mobilisation of ankylosed joints had so far been little used in France, probably because they continued to use Ollier's mobilising resection in certain cases. In the shoulder, elbow, and wrist Ollier's technique gave excellent results, but to obtain them great tenacity and patience was required, not only of the surgeon, but also of the patient during the weeks of mobilisation, while the articulation adapted itself to the neoarthrosis. Arthroplasty was, however, undoubtedly an improvement in technique, and hastened results. For the hip, mobilising resection was sometimes indicated, for example, in the case of large bony fusions where surgical modelling and interposition was difficult. Apart from these cases, arthroplasty was again an advance in treatment.

Arthroplasty had, in fact, created a new chapter in surgery.

Dr. Leriche gave it as his own experience of 25 cases of ankylosis of the elbow, 15 of which had been treated by Ollier's method and the remainder by arthroplasty with interposition, that the results of the former were at least as good as those of the latter. After seeing Dr. Putti's results, however, there could no longer be any doubt that arthroplasty of the knee was preferable to a stiff joint in the best position (full extension), which was at times very inconvenient to the patient.

Discussion.

Sir William Macewen (Glasgow) pointed out that flail joints did not result from the old-fashioned excision provided the resection were kept within the limits of the capsule. The function of the interposed flap he believed was to limit the growth of bone from the raw bony surfaces; it was more important when the diaphysis was involved on account of the greater osteogenetic power of the diaphysis as compared with the epiphysis. He thought that movement might have been improved in some of the cases by a larger resection of bone. Dr. Putti's arthroplasty of the knee was undoubtedly a great advance in surgery.

Mr. R. C. Elmslie (London) considered that a knowledge of when to perform arthroplasty was more important than skill in the technique of the operation. One stiff joint might be very little disability; he knew of cases with an ankylosed hip who could walk ten miles, whereas a mobilised joint might be a great disability if, as sometimes happened, it were painful. Double ankylosis of the hip might call for a mobilising operation on one side, but as a rule arthroplasty was more often indicated in the upper than in the lower extremity. In respect of the shoulder arthroplasty failed to reproduce the complicated movements of the joint. In the elbow he obtained very satisfactory functional results by an excision, shaping the olecranon and preserving the triceps, without any flap interposition.

Sir W. I. de Courcy Wheeler (Dublin) said that arthroplasty of the shoulder was only indicated when scapular movement was deficient; bony ankylosis was better for a working man. It was unfortunate that no satisfactory results had yet been obtained from arthroplasty of the finger-joints; following Murphy, he had tried the interposition of discs of cartilage, but without success. He had performed successfully a double arthroplasty of the knee, but was cautious in advising the operation. Since early painless movement was necessary if a new joint were to be formed, he urged the necessity for excision of all remains of capsule and ligaments which carried nerves. In the hip he had been disappointed with his own results, although he had seen many encouraging results of others. Finally, he described the operation of cheilotomy (the resection of osteophytic masses) as having given astonishingly good result in osteoarthritis of the hip.

Dr. Jiraseck (Prague) gave the results of 25 arthroplasties at Prof. Kukula's clinic. The interposed flap consisted of omental fat in 9 cases, of subcutaneous fat in 7 cases, and of fascia lata in 9 cases. The most successful cases were in the elbow (88 per cent. successful) and knee (77 per cent. successful), while the one case of arthroplasty of the hip failed. Re-ankylosis, when it occurred, was due to the return of suppuration, or to lack of cöoperation on the part of the patient.

Dr. Villandre (Barcelona) described his results in arthroplasty of the jaw and elbow, and illustrated them by lantern slides.

Mr. R. A. Stoney (Dublin) considered arthroplasty unnecessary where excision gave a good movable joint. In the elbow in cases of war wounds he had obtained good results from excision (limited as regards the bones of the forearm, but more radical as regards the humerus), being careful to preserve the attachment of the triceps to the periosteum. The cavity left was packed with "bipped" gauze and lat allowed to close by granulation.

Dr. T. Tuffier (Paris) found that the greate difficulty in performing Putti's operation on t knee was to obtain and preserve the right g between the new articular surfaces. To obviate t he employed a pair of jointed steel plates attach to the femur and tibia by screws; this was allow to remain in place for about a month, during whi it allowed of movements and abolished the ne for extension. It was then removed under lo anæsthesia.

Drs. Corachan (Barcelona), Zahradnicky (Pragu Ribas y Ribas (Barcelona), Puiz y Sureda (Bar lona), and Juracz (Posen) also spoke.

On Wednesday evening the members of t Congress were entertained at a reception by t Lord Mayor and Lady Mayoress at the Mansi House.

On Wednesday afternoon, at an "unofficial meeting, Dr. Serge Voronoff (Paris) gave a furth demonstration on the subject of testicular graftin illustrated by cinematograph pictures of his expe mental work on rams and goats, and of the resu obtained in man. Dr. Pauchet (Paris) described t technique of blood transfusion, and also illustrat the methods employed by cinematograph pictures.

Thursday, July 19th.

Nerve Injuries.

Dr. P. Henriksen (Skien) discussed the results surgical treatment of injury of the nerves. He s that after a nerve had been cut with a sharp inst ment the peripheral nerve tended to heal spontaneou without leaving any permanent injury. Sensibili reappeared as soon as there was contact between t nerve ends, and mobility after about two mont After a nerve had been sutured, function develop in the same way as in spontaneous healing if t suture had been correctly performed. But heali might not take place if fat were interposed, or infection resulted. After secondary suture, sensibili appeared at once and mobility and the reactions electrical currents might occur after two mont and develop as after primary suture. If the ne were subjected to blunt force, such as crushing tearing, the neurilemma nuclei were injured and so completely destroyed, so that part of the ne formed nerve fibres were not capable of living a degenerated. When the neurilemma nuclei w totally destroyed no new nerve fibres were form and the nerve atrophied. The changes were m marked at the actual spot where the crushing to place, and the nerve was adherent to surroundi tissue. Improvement might be obtained in so instances by freeing the nerve from adhesions. T best method seemed to be to resect the thicken fibrous part. The degree of function secured th depended on the general state of the nerve.

Prof. A. Gosset (Paris) thought that the followi cases of nerve wounds should be operated on:—

(*a*) *Cases of Progressive Compression Caus Serious Irritation or Interruption.*—In these ty liberation could not injure the patient or the ne and he saw no advantage in delaying the operati

(*b*) *All Cases of Complete Interruption.*—Th should be clinically examined by competent neu logists, and if they showed no sign or regenerati or showed signs of useless regeneration, should operated on.

(*c*) *All Cases of Causalgias or Serious Neuritis.* There was, however, no fixed rule for this lat type.

He said that war surgery had shown us that we sho certainly, during the preliminary surgical clean of the wound, examine the state of the import vessels and nerves. This was still more necess if from the first day there were signs of paralysis o large peripheral nerve trunk. Any severed ne should at once be stitched up to allow of rapid regene tion, and, moreover, to avoid formation of fibr ssue. When the nerve was bruised, it seemed best preserve it and keep it under constant observation. hen some time had elapsed before the patient had ceived medical attention, the lesion should be erated on as quickly as possible. Aseptic operation, wever, was essential, and it might be necessary to ait some weeks until all signs of suppuration had sappeared. As regards the operation to be done, of. Gosset thought that in the case of nerve com-ession with signs of irritation, simple liberation as all that was necessary. Intra-nervous extraneous dies should always be taken out, but small intra-scicular fibromata should be enucleated only when e operation was without danger to the healthy rve bundles. If there were interruption in the ntinuity of the nerve which showed no improvement ter several examinations, resection of the fibrous llus and suture of the neurilemma should be under-ken. If suture were impossible, a graft, or the viding into two of the lower end, should be practised. ood results would only be obtained if the patient d been kept free from ankylosis and muscular ntracture during the time preceding the surgical eatment. Experience had shown that the period regeneration might extend from 18 months to veral years.

In conclusion, he said that in war surgery, as well in civil surgery, immediate suture of the nerves ould usually be completely successful. If surgical eatment had been delayed from one month to two ars, good functional results might occur in 40 to per cent. of the cases. Even after this time eatment should be tried; it might be successful, it there was less chance. Nevertheless, it was his inion that the surgical treatment of the big nerve unks is by no means illusory if it were carefully actised by skilled specialists, and if the patient uld be kept under prolonged observation.

Dr. Charles H. Frazier (Philadelphia) discussed the sults of 3000 gunshot wounds of the peripheral rves treated in the Reconstruction Hospitals under e control of the Surgeon-General's Office, U.S.A. Of ese, about 2400 involved important nerves and 1800 re submitted to operations of various kinds, suture, sis, or nerve transplants. Experience having shown at spontaneous recovery might take place up till months after the injury, it was usual to delay erative procedure until the end of that period; rther experience showed that successful suture uld be performed after a lapse of two years. In ree-quarters of the operations the procedure adopted s resection of the ends and suture; the technique s similar to that employed in other countries, and e actual resection tended to become more extensive th greater experience of the operator. Partial section with suture was a delicate operation not en performed. When the resection had been so tensive that the ends could not be got together by y manœuvre, such as transposition, he favoured a o-stage operation rather than "bridging" with a aft, since the results of the latter had, with only a v exceptions, been uniformly unsuccessful. As gards the quality of recovery from resection and ture, it was rarely perfect, and the question of the aring of the intraneural plexuses on this elicited vergent views in America. It was difficult to account the high percentage of failures in certain nerves—, external popliteal. Neurolysis failed in 26 per it. of cases. Finally, he considered that the results these nerves were sufficiently good to warrant the exploration and suture if possible in cases of nplete lesions of the median, ulnar, musculo-spiral, d sciatic. A complete statistical survey of the end-ults was unfortunately prevented by the transfer-ce of the control of the cases to many different partments.

e Late Results of Surgical Intervention for Traumatic Lesions of Nerves.

Dr. A. Chiasserini read a paper by Dr. G. Verga av a) who died recently. The part played by Italy the study of the surgery of the peripheral nerves had been very important from a scientific point of view, thanks to the fundamental researches on the regeneration of nerves carried out at the Laboratory of Histology and General Pathology at the Royal University of Pavia, under the direction of Prof. Golgi. Dr. Verga himself had published the clinical results of 212 interventions on nerves (1916–18). It was only in a small minority of cases that we could obtain perfect recovery after surgical treatment. In a great many cases, considered to be successful, there was something lacking as regards sensibility or electric reactivity, or, perhaps, motility; in the latter case the operated limb was weaker and more easily tired. Usually the process of restoration of function stopped when only a more or less relative improvement was obtained. The precise estimation of the functional restoration of an operated nerve was always a delicate and difficult problem, and should only be undertaken by an experienced neurologist, who could have the cases under observation for a long time after operation. The percentage of improvement and recoveries obtained by Dr. Verga in 82 cases observed for over a year was (i.) recoveries, 52·4 per cent.; (ii.) improvements, 37·8 per cent.; (iii.) negative results, 9·7 per cent. He had included amongst the recoveries cases where a slight loss of strength or of function of the limb had been observed, and amongst the improvements all cases where, after operation, any favourable modification of the symptoms was manifest. Out of nine cases observed up to six and a half years after operation, only in one was a change for the worse observed. In all cases improvement had been the rule; this showed, he thought, that improvement is a question of time. The results obtained by suture and neurolysis were much superior to all other operations for making good great losses of nervous tissue. These other operations, however, should not be entirely condemned, because some of them, especially grafting, might give good results, but recourse should only be made to them where other means failed.

True End-results of Nerve Suture.

Mr. H. Platt (Manchester), who read a summary of a paper by himself and W. R. Bristow, said that the results of nerve suture had fallen short of expectations, as was shown by an analysis of the true end-results in 157 cases now published for the first time by Prof. J. B. Stopford. (See table on p. 174.)

The mere punctual appearance of the first signs of recovery was no indication that complete restoration of conductivity would eventually occur, and even in the very best results there was some departure from the normal. The most successful cases were those obtained in the musculo-spiral nerve, but even here the synergic action of the extensors of the wrist when "making a fist" rarely recovered. The median and ulnar nerves had both given disappointing results, the important sensory function of the former never having been completely restored. In the sciatic nerve the results again were poor; no case of recovery of the intrinsic muscles of the foot was recorded, and the type of sensory recovery had been defective, often leading to painful traumatic ulceration of the foot, for which amputation was sometimes demanded. *Neurolysis* (freeing or liberation of the nerve) when practised early, before the compression had resulted in degeneration of the axis cylinders, had given rapidly successful results in the return of both sensory and motor functions. But where the compression had been in existence for a long time the restoration of function depended upon regeneration of the axis cylinders through the interior of a nerve trunk, the seat of an interstitial fibrosis, and was therefore generally very incomplete. Nevertheless neurolysis was often a legitimate experiment to be followed by resection and suture at a later date, if signs of recovery did not ensue. *When nerve-suture failed*, an alternative procedure available in certain cases was tendon transplantation; this had been employed chiefly for musculo-spiral lesions, the pronator radii teres, flexor carpi radialis, and flexor carpi ulnaris being transplanted into the extensors

Recoveries Seen in True End-Results—157 Suture Operations.

Grangethorpe Hospital, Manchester.

		Motor function.					Sensory function.			
Nerve.	Number of operations.	Proximal muscles plus distal muscles (total) (complete motor recovery).	Proximal muscles plus distal (partial).	Proximal muscles alone.	Distal muscles.	No motor recovery.	Protopathic recovery alone.	Protopathic plus epicritic (partial).	Sensory complete.	No sensory
Musculo-spiral ..	37	20	16	1	—	—	—	—	—	—
Ulnar—	38									
Upper arm	19	None.	12	7	—	—	9	4	None.	6
Forearm	19	—	—	—	Hypothenar alone 8. Hypothenar and 1 other, 9. 1st dorsal interosseous 1.	1	6	9	1	3
Median—	43									
Upper arm	22	None.	7	15	—	—	11	6	None.	5
Forearm	21	—	—	—	9	12	9	10	None.	2
Sciatic	27	None.	None.	27 I.P. and E.P. muscles 20 I.P. alone 7.	—	—	16 Incomplete 14. Complete 2.	6	None.	5
External popliteal ..	12	—	—	6 complete 6 incomplete.	—	—	6	None.	4	2

of the wrist, thumb, and fingers. Two cases where this operation had been practised were exhibited.

Nerve-grafting.

Mr. W. R. Bristow (London) continued the joint report. "Nerve-grafting" (i.e., the bridging of a gap in a nerve after resection or from injury with a portion of nerve obtained from the same or another individual) must be regarded as a last resort; every effort should first be made and every device employed to obtain end-to-end suture. Many claims to success from grafting had been examined by the Medical Research Council and all had failed to convince. Most of the claims were based on the presence of "trick-movements"; thus with a complete median lesion the patient often learnt to flex the wrist by means of the extensor ossis metacarpi pollicis. Microphotographs showing the results of nerve-suture were then shown. It was pointed out that interstitial fibrosis due to an ascending toxic neuritis was demonstrable in one section two and a half inches proximal to the end bulb; in such a case it would be impossible to excise all the damaged nerve before suture, and this explained the frequency of partial or total failure in suture of war injuries. A section of a "nerve-graft" removed three and a half years after implantation was also displayed which illustrated the reaction around a stitch and showed the total failure of axons from the central end to grow into the substance of the graft. Another section of nerve obtained from a limb amputated for pain showed demyelination. Drawings of microscopic sections of muscle (1) after two and a half years denervation; (2) in ischæmic paralysis showed that in the former, in which recovery was still possible, the transverse striation of the muscle fibres was lost and fibrous tissue increased, while in the latter the sarcolemma nuclei had disappeared and the muscle fibres were beyond recovery. Finally, he pointed out that the joint report was based upon the results of war injuries, and that the results of suture of nerve injuries in civil practice, where sepsis should not play so large a part, should be much better.

DISCUSSION.

Dr. R. Leriche (Lyons) discussed causalgia, which he had found was not infrequently associated with a gross arterial or nervous lesion, although sometimes no such lesion was to be found. That causalgia was not psychic in origin was proved by the fact that cases which originated in 1914 or 1915 were still suffering in spite of the end of the war, and by the occasional occurrence of causalgia in civil injuri
While causalgia was the result of a peripheral lesi
operation was successful, but as soon as the lesi
had spread to the nerve roots or the cord operati
was less successful. Believing that pain was carri
by the sympathetic nerves, he had performed exsecti
of the sympathetic in nine cases, with five go
results, two improvements, and two failures. Prima
exsection of a portion of the involved nerve tru
had been performed three times, with one cure a
two failures. In the cured case subsequent sutu
was performed, but the result was not seen as t
patient died of another malady; 17 late exsectio
gave only one success. Sympathetic exsection w
only useful for cases of functional disturban
unassociated with demonstrable anatomical chan

Mr. Archibald Young (Glasgow) held a brief
the value of a sheath (either of vein, fat, or musc
around a sutured nerve; 33 cases in which he h
employed such a sheath, when contrasted with oth
in which no sheath was employed, showed a hig
standard of recovery. The bed of a sutured ne
was also important; he considered displaceme
from its original bed to be an important part of t
technique of nerve-suture. He had had some succ
with nerve-bridging.

Dr. A. Chiasserini (Rome) agreed that end-to-e
suture gave the best results, but claimed to ha
had a success from the implantation of a graft p
served in alcohol in a case where the median ne
was severed in the forearm. The sensory recov
was good, and the motor recovery moderate.
then gave details, illustrated by lantern slides,
experimental work on nerve-grafting in dogs. T
best results were obtained with autogenous gra
but good results accrued from homogeneous. Wh
removed some months later the nerve appeared alm
normal, and histologically nerve fibres could
traced through the graft, especially in its periphe
to the distal end. Such nerves responded to faradi
tion. Wrapping the suture line at the prim
operation was wrong, but might be useful as
secondary measure when adhesions were preventi
the growth of the nerve fibres along the periphe
He concluded that the almost universal failure
nerve-grafts in man was due to faulty technique.

In the afternoon the Royal College of Physici
was opened to members of the Congress, and th
was an exhibition of specimens of surgical a
anatomical interest.

On Thursday evening a reception was held at t
Royal College of Surgeons, Lincoln's Inn Fiel

embers of the Congress were received by the Presi-
nt, Sir John Bland-Sutton, and Lady Bland-Sutton,
d by Mr. and Mrs. H. J. Waring. A number of
unterian relics were exhibited.

FRIDAY, JULY 20TH.

Serotherapy and Vaccinotherapy in Surgery.

Dr. Louis Bazy's (Paris) paper was read by Dr.
chel, who said that doubtless the knowledge of the
raspecific effects of serums and vaccine (Widal's
lloidoclasic shock, effect of Nolf's peptone) had its
e, but in the present state of our knowledge we
uld not make full uses of the resources of serotherapy
d vaccinotherapy if we did not recognise the idea
specificity. Apart from such, especially antitoxic
ra (such as antitetanic serum, antigangrene serum,
e efficacy of which had been amply proved), most of
ose used in surgery were less certain in their effect.
e therefore thought it advisable to direct attention
local applications of serotherapy. This might
ove of the greatest use to surgeons. It was also
cessary to insist on the fact that repeated injections
serum became less and less effective, and therefore
ey should only be used in cases of extreme need,
d then only as a last resort. The object of the use
vaccines was to produce artificially in the organism
state similar to the one in which it would be if it
d recovered from an ordinary attack of the disease
question (Bordet). This definition showed that
surgery vaccination was of no practical value, as
rgical infections when healed do not confer immu-
ty. Recourse is mostly made to vaccinotherapy.
is consisted in treating the disease during its
velopment by injection of the specific germ more
less modified. Again, use might be made of
cteriotherapy. Here microbic products were used
ich had no connexion with the disease that was
ing treated. Another method was to try a "mixed
munisation," employing sera and vaccines—this
ght be called serovaccination. Generally speaking,
ra should be used to produce a quick, but not a
sting, effect in cases of urgency. But vaccines gave
ly slow results, which were, however, more lasting.
rotherapy and vaccinotherapy were most valuable
the surgeons; they facilitated surgical treatment
d localised it, but neither sera nor vaccines were of
y use in necrosis or cicatricial lesions. Attention
ould be paid to signs of susceptibility to microbes
the part of "germ bearers," for most cases of
operative shock" are due to the sudden develop-
ent of a germ, whose virulence had increased under
nditions which had become less able to combat it.
e skilful use of serotherapy and vaccines would
able us to anticipate and to counteract this sus-
ptibility.

DISCUSSION.

Mr. D. P. D. Wilkie (Edinburgh), recognising that
e mortality from operations on the large intestine
ose chiefly from sepsis, either as wound suppura-
n, peritonitis, or thrombosis of large veins (the
usal organism being the streptococcus or the
cillus coli), had performed some animal experiments
th a view to discovering whether it would not be
ssible to acquire some degree of immunity to
ose organisms. Both vaccines and the injection
nucleic acid were found to increase the resisting
wers of animals, and a combination of both so
ised the resistance that the animal could withstand
e injection of 3 M.L.D. of the organism into the
ritoneum. He had therefore introduced this prac-
e into his routine preparation for such operations
colectomy or the closure of a fæcal fistula. Ten
ys before operation a dose of 10,000,000 strepto-
ccal vaccine was given, and this was repeated
ree days before operation; on the night before
eration a dose of 2 per cent. nucleic acid was
ven which resulted in a leucocytosis of 12,000.
xty-three operations had been performed after this
pe of preparation with two deaths, neither of them
m sepsis.

Dr. de Zawadski (Warsaw) had found vaccino-
erapy very useful in cases of serious cervical
suppuration, peritonitis, and empyema. It would not save all cases, but was a great help to rapid recovery.

Sir Almroth Wright (London) suggested increasing the resistance of the body before certain operations, such as extraction of teeth and tonsillectomy, and the removal of cancers; the latter were often infected by the staphylococcus and the streptococcus before coming to the surface. The failure of antiseptics in war surgery could have been foretold from laboratory experiments, since antiseptics when mixed with blood formed a better culture medium than blood alone. As regards vaccinotherapy, it was now apparent that not all bacterial infections could be successfully treated by vaccines (Pasteur's original view), for the combating of infection was carried on by two separate mechanisms: (1) by antibacterial substances in the blood, and (2) by phagocytosis by the leucocytes. In certain very acute infections the leucocytes were poisoned and unable to carry on phagocytosis, even in the presence of large quantities of antibacterial substances in the blood. The fact that so many different varieties of vaccines (complete and partial antigens, sensitised, detoxicated and defatted vaccines) had been employed showed that there was something wrong in the application of vaccine therapy. What was wrong was the dosage, which ought to be controlled by the response made by the body fluids. This was easily tested "in vitro," and if it was found that the addition of vaccine to the patient's blood resulted in a decrease of phagocytosis, it was certain that the administration of the vaccine would be harmful. In such cases, and in severe infections where no phagocytosis was occurring although the opsonic power of the serum was raised above normal, what was required was a number of healthy leucocytes. This call could be met by immuno-transfusion—i.e., the transfusion of 500 c.cm. of defibrinated blood from a donor previously immunised by a vaccine. It was important that the blood should be defibrinated and not citrated, as citrates adversely affected the leucocytes. He considered that passive immunisation with horse or other alien serum was useless.

Dr. Leclercq (Morristown, New Jersey), Dr. Zahradnicky (Prague), and Dr. Mayer (Brussels) also spoke.

Operative Shock.

Dr. George W. Crile (Cleveland, U.S.A.) read a paper on an Electrochemical Interpretation of Shock and Exhaustion. He elaborated a theory that man and animals are electrochemical mechanisms constructed on the pattern of the constituent cells, each of which in itself was an electrochemical mechanism. The difference in potential in the cells was maintained by oxidation. The brain had the highest rate of oxidation and the liver the lowest, hence he suggested the hypothesis that the positive pole was the brain and the negative the liver; the connecting wires were the nerves, and the salts in solution the electrolytic fluid in which the electrochemical mechanism was immersed. This hypothesis would interpret the fact that when the liver or the brain was removed the organism perished; if the animal were deprived of oxygen, the difference of potential within the cells would be lost and death would result. It would explain the essential rôle of water in living processes—i.e., as a non-conductor and a solvent attaining ionisation. Chemical action and electric conductivity were controlled by heat and cold; abdominal surgery in the colder months in unwarmed front area huts illustrated the fact that there was probably a lethal cold and a lethal warm temperature for this electrochemical mechanism. The electrochemical theory would interpret the specific antithetic action of adrenalin upon the temperature of the brain and of the liver and other organs in the splanchnic area. It would interpret the increase in electric conductivity of the brain by iodine, iodoform, and thyroid extract (hyperthyroidism); and the decreased conductivity of the brain after thyroidectomy. It would interpret the interference with digestion by the strong emotions, by injury, by pain, by infections, &c., for the splanchnic processes were inhibited while the brain was stimulated. It would interpret the antithetic effects of fear and faith, and the failure of the health in man and animals under the stress of chronic fear or anger or other strong emotions. This theory would interpret the essential function of sleep as the period during which the difference in potential in the batteries which drive the organism, which had been decreased by the activities of the day, was restored. It would interpret the fact that in surgical operations, if a state of negativity and the internal respiration were maintained, there would be no surgical shock. The state of negativity was maintained by: (*a*) Exclusion of fear by management, by operation in the patient's room, by morphine, by analgesia; (*b*) exclusion of traumatic stimuli by local or regional anæsthesia, by gentle handling, by protection of the wounds from the irritation of air; (*c*) exclusion of stimulation by stimulant drugs. The entire process whereby the state of negativity was secured and the internal respiration—difference in potential—was maintained was included in the combination of methods of pre- and post-operative management and of surgical technique which was called *anociation.* The internal respiration was maintained by fluids, by warmth, by blood transfusion, by rest, by sleep, and by the avoidance of deep inhalation anæsthesia. Finally, and included in the above, the theory that man is an electrochemical mechanism interpreted many of the phenomena of life.

Traumatic Shock from a Clinical Point of View.

Dr. P. Mocquot read a paper which was the combined work of himself and his colleagues, Drs. M. Quénu and P. Duval. They showed the evolution of ideas concerning shock, and pointed out what the Medical Research Council and the Société Nationale de Chirurgie de France had done. They then turned to the clinical side of the subject, and laid stress on the early appearance of the peculiar symptoms of traumatic shock, and gave a list, based mostly on cases during the war, of the various signs, such as low temperature, low blood pressure, blood and urine analysis, &c. In addition to the recognised type they described a type of mitigated shock, often met with in ordinary surgery, caused by attrition of the tissues. It outlined a new chapter of surgical pathology. The prognosis of traumatic shock might be estimated by the temperature, blood pressure, and by the analysis of the blood and urine. The recovery of kidney function, the excretion of urea, and the diminution of the urea-content of the blood were the most favourable signs. Therapeutic treatment included prophylactic measures and the treatment of the shock when it occurred. Prompt medical and surgical treatment were a sine qua non of prophylactic care. The best surgical treatment consisted in the excision of the wound; immunisation by means of an anti-shock serum had not yet proved its efficiency, at least from a clinical point of view. The treatment of an ascertained case of shock might be symptomatic. The former was especially useful as a means of first aid. Causal treatment was grounded on the new view of shock as an intoxication, the seat of which was the traumatic lesion. Theoretically, the wound which gave rise to the toxins should be excised. Practically we were confronted with two separate questions as to whether the affected limb should or should not be amputated. In the former case recourse should be had to "primary" amputation. In the latter case the treatment should consist of thorough excision of the wound, and the devitalised parts should be cut out as widely as possible. The operation should be quick. The wound was sprinkled with hypertonic solution and no attempt should be made at first to bring the edges of the wound together. Further research was yet required to decide on the most suitable anæsthetic.

Mr. John Fraser (Edinburgh) pointed out that surgical shock arose from various causes, such as injury to a sensitive part like the hand, from the early symptoms of peritonitis, burns in a child, and extensive crushing injuries of the limbs. Whatever its
origin, the essential feature of shock remained co
stant—namely, diminution of the volume of blo
from its passage into the vast capillary system whe
it was not under the control of the bulbar vas
motor centre. The extent of this capillary syste
would be realised from the fact that if placed in li
the capillaries of the human body would extend tv
and a half times around the world. There w
growing evidence that these capillaries had an ind
pendent muscle system, and recently in observatio
on the swim-bladder of the eel he had seen dilatati
of the capillaries occur from the shock of cutting.

Dr. Pauchet (Paris) held that all the sympto
of shock disappeared rapidly after oxygenated blo
transfusion by Bécart's method. Operation sho
should be avoided by a preliminary blood tran
fusion, repeated if necessary during the progress
the operation; transfusion should not be left un
it was obviously useless. The effects of oxygenat
blood transfusion were a lasting rise of blood pressu
and improvement in the patient's condition from t
supply of oxygen to the central nervous and end
crine systems: further acidosis was neutralised.

Dr. Ufreduzzi (Turin) said that in states of tra
matic shock he used local or splanchnic anæsthe
for operations. He found it difficult to believe th
the substance or toxin which produced shock ca
from injured muscle, since operation confined
muscle was not attended with shock.

Dr. Jiraseck (Prague) and Dr. de Zawadski also spok

Dr. W. W. Keen (Philadelphia) proposed a vo
of thanks to the President and officers, nami
especially Dr. Mayer, the secretary-general, and
D'Arcy Power and Mr. J. E. H. Roberts, the Briti
organising secretaries, to whose work the success
the Congress was largely due. This was carried wi
acclamation, and Sir William Macewen replied.

It was announced that the next Congress of t
Society would be held at Rome in 1926 under t
presidency of Dr. Giordano (Venice), when the su
jects for discussion would be (1) the Surgery of t
Spleen, (2) Cerebral Tumours, (3) Radio-therapy
Uterine Cancer, and two other subjects to be chos
later by the scientific committee consisting of
Percy Sargent (U.K.), Dr. Gosset (France),
Alessandri (Italy), Dr. Henschen (Switzerland), a
Dr. Ribas y Ribas (Spain).

The annual banquet was held on Friday, July 20t
at the Trocadero Restaurant, with Sir Willia
Macewen, F.R.S., in the chair. The large compa
included the Presidents of the Royal Colleges
Physicians and Surgeons and of the leading Lond
medical societies. Sir William Macewen toasted t
foreign delegates, and Messrs. Alessandri, May
Haussen, Petridis, Koch, Nicolaysen, de Lawads
Kayser, de Quervain, and Crile, representing Ita
Belgium and France, Denmark, Egypt, Hollan
Norway, Poland, Sweden, Switzerland, and the Unit
States of America respectively, replied. The speech
dwelt almost entirely with the feelings of gratitude f
by the delegates for the hospitality which had be
shown them in London, for the interesting work whi
they had inspected in the hospitals, and the excelle
papers to which they had listened at the Conferen
The next Conference in Rome was frequent
mentioned and most hopeful anticipations w
expressed that a large number of their Lond
colleagues would be present to meet the forei
delegates.

INDEX TO "THE LANCET," VOL. I., 1923.

THE Index and Title-page to Vol. I., 1923, whi
was completed with the issue of June 30th, is n
ready. A copy will be sent gratis to subscribers
receipt of a post-card addressed to the Manager
THE LANCET, 1, Bedford-street, Strand, W.C. 2.

ROYAL SOCIETY OF MEDICINE.—The William Gibs
Research Scholarship has been awarded to Miss M. Forrest
Brown, of Dundee.

THE LANCET.

LONDON: SATURDAY, JULY 28, 1923.

HE ANNUAL MEETING OF THE BRITISH MEDICAL ASSOCIATION.

THE annual meeting of the British Medical Associa- on, which is drawing to a close at Portsmouth, was ld in an expansive mood. Its membership has ached the high-water mark of 1912 and there is no ason to anticipate the ebb which then followed, for ssension within the ranks over the broad principles insurance practice is practically at an end, and the nel executive is looking forward with confidence an amicable settlement of the outstanding question the cash value of medical benefit to the community. he chairman of the body which has been conducting e matter received from the meeting a gratifying dorsement of past policy and a free hand for the mediate future. The financial situation of the ssociation is indicated by the fact that the treasurer d not blench at the proposal to disburse £100,000 so in the purchase and adaptation of a new me which has been acquired in the neighbourhood Tavistock-square, or even at the additional outlay £50,000 which would provide for the social nenities long desired by members of the Association sident outside the metropolitan area. The building it stands possesses artistic merit, affords sufficient ope for present activities, and contains a hall large ough for meetings of representatives. Situated ithin a stone's-throw of what is presumably the w site of London University, the officers of e Association foresee the possibility of making e house a nucleus of organised post-graduate aching in London. A substantial sum is already t apart by the treasurer for the granting of research holarships, and the chairman of the Science Com- ittee desires to increase this sum. A third source quiet satisfaction lay in the continuing success of e Journal of the Association, under the editorship Sir DAWSON WILLIAMS, to whom warm congratula- on was tendered on the completion of 25 years in e editorial chair.

The new President of the Association, Mr. C. P. HILDE, chose for his inaugural address on Tues- ay the subject of "Environment and Health." n abstract of his address appears at the front of ur present issue. Speaking as the chairman of the ortsmouth Health and Housing Committee, Mr. HILDE dwelt on the need for concentration on the revention of disease, and on strengthening resistance disease by the improvement of environment, rather an on the search for cures or palliatives when the amage is already done ; and on care for the environ- ent of the wage-earning classes as the greatest of all e problems of preventive medicine. Coming from ne who is also senior surgeon to the Royal Ports- outh Hospital, these remarks will have carried the greater weight; they illustrate well the "whole-hearted joining of hands for a common purpose" described in his address as the best evidence of a loyal and healthy citizenship. We shall hardly be wrong in thinking that Mr. CHILDE had also in mind with no little satisfaction the signs of reconciliation between preventive and remedial methods within the borders of the Association. The rift ever growing wider between the aims of the Society of Medical Officers of Health and the British Medical Association has now been bridged by the mutual acceptance of a scheme for coöperation which permits of a common declaration of policy on general lines and which precludes the Society from taking independent medico-political action. This decision, ratified by the Representative Meeting at its first session, is the result of negotiations which have been in train since the annual gathering at Cambridge three years ago, and goes far deeper than the mere agreement on rates of salary and tenure of office, important as these are. The conference which drew up the scheme recognised that "benefit would be likely to result from a closer coöperation of the local medical profession with the local authorities' schemes of medical survey or inspection and treatment," and one of the first fruits of this recognition is the working agreement, which we chronicled last week, between practitioners and civic council in the urban district of Willesden, where the two policies had been allowed to grow apart until reconciliation became difficult and tedious. In Portsmouth there has been no such divergence, although the sanitary authority is keen. In many other places similar divergence must have arisen if the advocates of both policies had been as keen as they were at Willesden. Within the British Medical Association itself there will now be the reconciling influence. A great opportunity has not been lost.

CANCER FACTS AND CANCER THEORIES.

FOR hundreds of years cancer has occupied the attention of physicians and surgeons, and it would be impossible to estimate the expenditure of time and energy on this absorbing subject since the doctrine of cellular pathology was first developed. It would be too much to hope that this labour has always been wisely directed or accurately performed. Much of it has resulted in knowledge which is permanent, but much more has clogged the literature with doubtful if not inaccurate statements, so that year by year the subject becomes more obscure, and the modern investigator finds his task not always lightened by the work of his predecessors, and rendered sometimes more difficult. Numberless examples of this could be quoted, but two will suffice. What are the actual results of operation in, say, cancer of the breast? What is the proportion of absolute cures, and how do the modern operations compare with the old, either as palliative or curative measures? Accurate answers to these questions are difficult to obtain, and, furthermore, there is a tendency for the written word to be forgotten though the personal impression survives; and the natural optimism of the human race connives only too readily in the conversion of the possible into the probable. Again, on the academic side, is the endothelial cell as prone to neoplastic transformation as the literature of recent years would lead one to suppose? It is, of course, a matter of some importance in view of the possibility that cancer may be due to some circulating substance, virus, hormone, or what not; but who shall say when histologists disagree? The situation is not improved by that sinister influence, often exercised by teratology on its votaries, which demands the elaboration of theories. It is impossible to contemplate with equanimity the sum of human endeavour which has been squandered in supporting or disproving unworthy theories.

Modern experimental methods are throwing on the cancer problem a light which bids fair to be powerful enough to illuminate its darkest corners, and one cannot read the article by the Director of the Imperial Cancer Research Fund, which appears in this issue, without experiencing a thrill of expectation. The elaboration of a technique by which cancer can be produced practically at will, combined with other methods of biological research, such as tissue culture, must undoubtedly and in the near future lead to most important results. Already theories which for generations have dominated certain schools of pathology are in process of demolition. The vague conception of "tissue tension" by which the disappearance of a hypothetical physiological influence of one tissue or another was held to explain the origin of malignant growth is untenable in view of the modern conception that the cancer cell differs from its progenitor in the acquirement of an actual positive property, that of continuous proliferation, though the stimulus to this may be no longer active. And the behaviour of the malignant and innocent cells during propagation outside the body shows conclusively that anaplasia as described by v. Hausemann does not really exist. There is no true assumption of embryonic character by the malignant cell, and no specific loss of differentiation. At the same time the actual facts of human and experimental pathology which have hitherto been inexplicable are rapidly becoming clarified. Isolated observations which have meant little or nothing in themselves are being dovetailed one into the other, and our conceptions of what constitutes the malignant process are becoming firmer and more clearly cut every day.

The most significant aspect of the new work, however, is that which indicates the presence of a profound systemic or constitutional change in the individual in whom a malignant growth has developed. That such a change occurs is shown by the failure of animals in which a malignant growth has spontaneously occurred, or has been produced experimentally, to react in the usual way to fresh applications of tar. There seems to be quite definitely a high degree of resistance to the development of a second tumour, and though the experimental observations are few they fall into line with the facts of human pathology. It is common knowledge, f example, that multiple or even double primar malignant tumours in the same individual are rar Unless we conceive the possibility of the simultaneou action in different parts of the body of differen cancrogenic influences, the development of one tumou must be inimical to the growth of another. Wha constitutes this resistant state is as yet quite obscure— its presence can be recognised experimentally, bu there is nothing to indicate in what it consist Nevertheless, we are justified in believing that th next few years will see the question answered, wit results in the diagnosis and treatment of malignan disease which could not even have been foreshadowe a very few years ago.

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CHILD MORTALITY IN SCOTLAND.

The rates of infant and child mortality in Scotlan for a series of years up to and including 1922 are give in the fourth annual report of the Scottish Board Health, recently issued and summarised on anothe page of our present issue. We note that in the thr years 1919–21 the rate of infant mortality average 94 per 1000 births in Scotland, as compared wit 84 in England and Wales. The only partial partic pation of Scotland in the degree of reduction infant mortality secured in England is obviously subject deserving of careful study. In both countri the rule holds good: that a high rate of infan mortality is associated in the same community with high death-rate in children over 1 and under 5 year of age. Thus in the experience of Scotland as whole, in 1915 an infant death-rate of 126·5 wa associated with a death-rate at ages 1–5 of 22· while in 1921 an infant death-rate of 90·3 was ass ciated with a death-rate at ages 1–5 of 12·4. valuable table given in an appendix to the repor shows the variations in, and by implication, the degre of preventability of infant mortality in different par of infancy. Thus, at ages 6–12 months infant mo tality per 1000 births varied from 4·1 in Perth to 26· in West Lothian, and from 32·1 in Hamilton to 14· in Dunfermline. Similarly at ages 3–6 months the were variations between 8·2 in Sterling and 23·8 i Kincardine, and between 9·7 in Clydebank and 27· in Aberdeen. At ages 1 to 3 months in towns with population of over 20,000 infant death-rates varie from 6·3 (Hamilton) to 22·3 (Aberdeen), and at ag between one week and under a month from 26·4 i Perth to 6·9 in Kirkcaldy. At ages under one wee the highest death-rate was 36·1 in Kilmarnock, an the lowest, 19·8, in Port Glasgow. It may be surmise that owing to inaccuracies of registration of age at deat there may have been some transfer between death under one week and deaths in the next three weeks extra-uterine life; but allowing for this, the variatio in local incidence of infant mortality in successi parts of infancy are very striking, and show the nee for further investigation. The figures point unmis takably to the preventability of a large part of th current infant mortality in the earlier months afte birth.

Annotations.

"Ne quid nimis."

HE MUSEUM OF THE COLLEGE OF SURGEONS.

THE most noteworthy event recorded by Sir rthur Keith, conservator of the museum of the oyal College of Surgeons of England, in his recent nual report is the completion of the series of ecimens which illustrates the principles of pathology —the great series which is now exhibited on special ands on the floor of Room III in the museum. In 10 Prof. S. G. Shattock and Mr. Cecil Beadles gan to select, arrange, and catalogue specimens r this purpose, and now, for the first time, a complete d systematic treatise on disease has been compiled, t in words, but in illustrative specimens. The ork was broken into by the war, and subsequently the high prices charged for museum materials, but the spring of the present year the series of general thology was completed. The scope of this section the museum is now fixed; if changes are made in e future they will have to be done by replacement ther than by addition. The re-arrangement, re-ounting, and re-cataloguing of that department of e museum which illustrates disease of the various rts, organs, and systems of the human body is w being undertaken. During the year a special om was provided to house and exhibit the War ffice collection of medical specimens—now known the Army Medical Collection—which had been nded over to the custody of the College. During e last 12 months 370 specimens have been mounted d added to this collection and considerable progress s been made with its cataloguing. The series of ratology and of human osteology have received luable additions during the year, and the mounting d arrangement of the material of the Onodi collec- n has made good progress. The preparation of new catalogue of the human remains preserved in e museum, a task undertaken by Miss M. L. ldesley, working under the Council of Scientific d Industrial Research, is still in progress. The mpletion of this work, which involves much labour d research into records, is regarded by the conservator most important in view of the desirability of ranging the human remains at our disposal in a oper time sequence, in order to study structural anges in succeeding periods, and an appeal has been ade to the Council of Scientific and Industrial esearch to have Miss Tildesley's appointment newed for at least another year. Reports on various man remains submitted to the College for examina- n have been made during the year and facilities have en afforded and material supplied to investigators various fields. In a brief report from the curator the physiological department of the museum, ecial attention is drawn to a series of eel larvæ esented by Dr. Johannes Schmidt in illustration of s important researches on the peculiar and till cently unknown breeding habits of this fish, among her recently acquired specimens. Mr. Alban Doran s almost completed the descriptive catalogue of the llection of surgical instruments in the possession the College, a task to which he has given 12 years his life. He is now engaged on the last section of e collection—the surgical instruments used by rbarous and semi-civilised peoples. 11,688 students d visitors used the museum during the past year. ecimens recently added to the museum will be on ew in Room I from Oct. 8th until Nov. 5th next.

NEW DIRECTOR-GENERAL OF THE NAVAL MEDICAL SERVICE.

IT has been officially announced that Surgeon ar-Admiral Joseph Chambers will succeed Surgeon ce-Admiral Sir Robert Hill as Director-General of e Medical Department of the Royal Navy on Oct. 1st. Sir Robert Hill, whose retirement will be received with regret, before his appointment some four years ago was Principal Medical Officer in the Grand Fleet, serving under both Lord Jellicoe and Lord Beatty. His excellent organisation at the Battle of Jutland received special commendation, and was recognised by his promotion to the rank of Deputy Surgeon-General. He was many times selected as medical officer on the ships which have carried the King and Queen when Prince and Princess of Wales on tours to India and the colonies.

Surgeon Rear-Admiral Joseph Chambers, who has had much administrative experience at Haslar, was appointed in 1908 health lecturer at the home ports, and later took over the charge of the Naval Hospital at the Cape of Good Hope. In 1913 he was appointed medical officer of the cruiser *Suffolk*, the original flagship during the war of the late Admiral Cradock, and in 1915 was transferred to Chatham Hospital. Since October last he has been in charge of Plymouth Hospital. We congratulate him on the high charge to which he has now been appointed.

OUTBREAKS OF SEPTIC SORE-THROAT SPREAD BY MILK.

OUTBREAKS of sore-throat, usually accompanied by other complications, spread by contaminated milk and due to streptococci, although not very common are yet sufficiently numerous to warrant careful consideration. Nearly all the earlier outbreaks were reported in this country, and Savage,[1] in 1912, gave particulars of 18 outbreaks in Great Britain. Since that date few further outbreaks have been reported here, but a considerable number has occurred in the U.S.A., many of which have been very extensive and have been studied in considerable detail. Notable American outbreaks are those in Boston, Chicago, and Baltimore. The pioneer scientific work upon the relationship between mastitis in the cow and human disease was done by Savage between 1906 and 1909, and is contained in three reports made to and published by the Local Government Board.[2] [3] [4] His views as to the relationship were summarised in a paper read before the Epidemiological Section of the Royal Society of Medicine, in February, 1911.[5] While in common with earlier continental workers he found that the ætiological factor in most cases of bovine mastitis was invasion by streptococci, he carried the subject further and differentiated between the types present. It is a striking fact that while on the one hand bovine mastitis is a widely prevalent condition and the importance of excluding from the milk-supply all the milk of infected animals is not well realised or acted upon, on the other hand, outbreaks of septic sore-throat from milk are rare. Savage was able to demonstrate that the ordinary type of streptococcus (*Streptococcus mastitidis*) associated with bovine mastitis is non-pathogenic to mice and other rodents, readily sets up mastitis in experimental goats, but fails to set up disease when inoculated upon the human throat. In contra-distinction the streptococci associated with human sore-throat possess a considerable pathogenicity for mice and guinea-pigs, but do not readily set up mastitis in goats. In one case, however, a streptococcus was isolated from a case of bovine mastitis which was of the human type. From his extended investigations Savage advanced the hypothesis which may be stated in his own words (1911): "Briefly stated, I regard the bovine udder and teat lesions, as commonly met with, as of purely bovine origin and, as such, harmless to man. Occasionally, either as an invasion superadded upon the original bovine lesions or as a primary infection of the milk-organs, there is a local infection with organisms of human origin. In such cases the conditions present may be decidedly prejudicial to man. In other words, the cow, in this class of infections, is only potentially pathogenic to man when it acts as an active or passive carrier of organisms of *human* origin."

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[1] W. G. Savage: Milk and the Public Health, 1912.

[2] Report of the Medical Officer, L.G.B., 1906–07, pp. 205–252.

[3] Ibid., 1907–08, pp. 359–424. [4] Ibid., 1908–09, pp. 294–315.

[5] Proc. Royal Soc. of Med., Epidemiological Section, 1911, iv., 73.

Since that date these conclusions have been very completely confirmed by extensive work in America, but conducted upon rather different lines. This work has mainly been in the direction of further differentiation of the types of streptococci found, particular attention being paid to their hæmolytic properties. For example, Theobald Smith and J. H. Brown[6] studied the streptococci isolated from certain milk-borne epidemics of tonsillitis in Massachusetts, in 1913 and 1914, and drew attention to the hæmolytic character of the strains responsible for the outbreaks, while they found the ordinary bovine streptococci to be non-hæmolytic. Their hæmolytic properties (β-type) are also different from those of the common throat streptococci (α-type). Other investigators, e.g., Davis,[7] have shown that hæmolytic streptococci may be found in many different types of milk and that these may differ from human hæmolytic streptococci in their being non-virulent to rabbits. The mere fact that they are hæmolytic does not establish their human origin. That hæmolytic streptococci of human origin may set up bovine mastitis in cows was shown by Davis and Capps[8] by direct experiment, the mastitis lasting for several weeks in the experimental cows, this time roughly corresponding to the duration of milk-borne epidemics. Jones[9] [10] [11] showed that both hæmolytic and non-hæmolytic types of streptococci may set up bovine mastitis, the human type producing the more severe inflammation. He also showed that a milker may readily carry streptococci on his hands from an infected to an uninfected cow. These and other investigations show that the differentiation of streptococci of human and bovine type, like all streptococcus classifications, is complicated and difficult and is not merely a question of hæmolytic ability. Other tests have been advanced, both by Savage and by the American workers. Avery and Cullen[12] have shown the advantage of determinations of hydrogen-ion concentration in glucose-broth cultures. Cultural sugar tests are also of importance. With present knowledge it would appear that, while no one test is conclusive, by employing a large series of differentiating characters it is possible to give an opinion with considerable certainty as to the type (human or bovine) of streptococcus present in a milk-spread outbreak. Brown and Orcutt[13] have found it possible in an outbreak in Boston in 1917 to identify the particular infective strain from the mastitis fluid with that from the sore throats of the sufferers.

The most recently recorded outbreak of septic sore-throat spread by milk is in Portland, Oregon, and is described by Benson and Sears.[14] The outbreak, which took place in March, 1922, was extensive, comprising 487 cases with 22 deaths. Almost all the cases drank milk from one particular dairy, which supplied non-pasteurised milk. The dairy supplied about 1200 persons, so a considerable number escaped infection. The mortality-rate was 4·3 per cent. It was ascertained that cows with diseased udders were kept in their regular stalls along with the healthy animals and in some instances only the milk from the diseased quarter was excluded from the milking. From one cow suffering from mastitis the authors isolated a streptococcus which they considered from its characters to be a human strain and which, as regards its virulence to rabbits and white mice, was of that type. It was identical with streptococci cultivated from the patients. Hæmolytic streptococci were isolated from only one of the milkers. This man had large red tonsils a gave a history of a mild sore-throat. They consid that this milker was responsible for the infection the diseased cow's udder, that she developed mastitis of human streptococcic origin in one quart and that the milk of this cow was at some ti included by mistake in the whole milk of the he The weak link in the argument is that the date of t examination of the milker is not given and no eviden is advanced to show that the milker might not ha been a sufferer from consuming infected milk rath than the indirect cause of the outbreak.

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[6] Jour. of Med. Research, 1915, xxxi., 455.
[7] Jour. of Inf. Dis., 1916, xix., 236.
[8] Ibid., 1914, xv., 135.
[9] Jour. of Exp. Med., 1918, xxviii., 149.
[10] Ibid., xxviii., 253.
[11] Ibid., xxviii., 735.
[12] Ibid., 1919, xxix., 215.
[13] Ibid., 1920, xxxi., 49.
[14] Jour. of Amer. Med. Assoc., 1923, June 2nd, 1608.

THE CENTENARY OF THE EDINBURGH VETERINARY COLLEGE.

THE dawn of veterinary science in the north Great Britain was due almost entirely to the dogg and persistent efforts of William Dick. For nea 40 years he laboured in the teaching and demo strating of animal diseases and ailments, and starti with a small class in Clyde-street he saw his effor after many struggles and vicissitudes, crowned wi success in the establishment of the Dick Veterina College. An interesting and well-written history this Veterinary College, by Dr. O. Charnock Bradl its principal, has just been published.[1] Since Dick death the College has had several stalwarts associat with its activities and teaching. T. Strangewa W. Williams, T. Walley, J. R. U. Dewar, and the gre financial helper, Alexander Inglis Maccallum, have been fine characters and men of mark. Many success practitioners scattered over the United Kingdom a the colonies have emanated from the College a now the successor of the Clyde-street building Summerhall will compare favourably with a veterinary college or school in the world. T book has some excellent photographs of the m who laid the foundations of veterinary science. centenary fund is about to be inaugurated to found post-graduate fellowship in veterinary science a the proceeds of the sale of this book are to go to t fund.

AN EPIDEMIC OF ERYTHEMA NODOSUM.

THE view that erythema nodosum is nothing mo than a rather obscure manifestation of tuberculo finds no support in the fact that now and then th eruption occurs in epidemics unrelated to any possib source of tuberculous infection. Such an epiden has been reported by Prof. E. Ledoux in t June number of *Revue de Médecine*. In a school midwifery 20 probationers were accommodated in dormitory, along the walls of which some of the be were placed. Other beds were in the centre of t dormitory, and it was a very significant fact that the probationers developing erythema nodosum we accommodated in the central beds, which were clo together. The first patient, aged 22, had be subject to frequent attacks of slight tonsillitis. Dec. 9th, 1921, she attended a confinement, duri which she felt perfectly well. On the 10th s developed a sore-throat, and in the evening of t same day an attack of shivering was accompanied a violent headache and a high temperature; f some days it ranged from 38·5° C. to 40° C. The was no cough, and the urine was normal. Typi erythema nodosum developed on the 13th, when first appeared on the legs. A day later some nod also appeared on the arms. The temperature return to normal on Dec. 21st, but during Jan. 21st, 22n and 23rd, and again during Feb. 3rd, 4th, 5t and 6th, there were attacks of what seemed to rheumatic fever, a temperature of 40° C. being ass ciated with painful swelling of the knees and ankl The next patient, aged 22, suffered for two or thr ys from slight headache and general malaise, but was not at first ill enough to give up work. On c. 18th the headache became violent, and two days er there was an extensive eruption of erythema losum on the legs and arms. Three or four days er some nodes appeared on the face, and there s slight conjunctivitis on the left side. On Dec. 25th knee became swollen and very painful. A blood ture proved negative. The third probationer fell on Jan. 1st, 1922, with headache and a tempera- e of 38·7° C. Next day erythema nodosum peared on the legs, and on the 3rd there was an ack of epistaxis; the headache was now less ere. By the 11th she was convalescent, but on 13th the temperature rose to 40·3° C., and the ees and ankles became swollen. The fourth bationer fell ill in the middle of January, when erythematous node appeared on the left leg. remained at work for four days, suffering only m slight lassitude. On the fifth day, however, temperature rose to 39·5° C., and she complained severe headache. An extensive outbreak of thema nodosum now appeared on the limbs, and was ill for 15 days with a high temperature. nvalescence was protracted and complicated by n in the joints, lasting several weeks. Only the t patient suffered from a sore-throat at the begin- g of the illness, but all four complained of severe adache and general malaise. In no case was re any family or personal history of tuberculosis, d there was no other evidence of tuberculosis.

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[1] History of the Edinburgh Veterinary College. By O. Charno Bradley. With illustrations. Edinburgh: Oliver and Boy 1923. Pp. 101. Parchment, 8*s.*; half linen, 5*s.* 6*d.*

STERILISATION OR SEGREGATION.

IN a recent pamphlet entitled "Sterilisation and ntal Deficiency" (2*d.*) the Central Association for ntal Welfare include a considered report by their nding medical committee on the question of the gical sterilisation of mental defectives, referred to m by the council of the Association in June, 1922. e report does not discuss legal or ethical considera- ns, but only the medical and biological problems volved. The provisional conclusion arrived at is that sterilisation of defectives is not under existing con- ions a practical policy, though it may be applicable individual cases.

To effect sterilisation in either sex the surgical opera- ns in common use are the following: (1) Vasectomy the male; (2) salpingectomy or ovariotomy in the nale. The evidence shows that vasectomy is a very nple and safe operation, that it effectively prevents ocreation, and that it does not interfere with physiological equilibrium of the individual. The erations necessary in the female are of a more ious nature and involve all the risks pertaining an abdominal operation, as much risk perhaps as imple operation for appendicitis. Ovariotomy inter- es with the physiological equilibrium. Either opera- n prevents propagation. Sterilisation is recommended its advocates for two main purposes: (*a*) With the ject of ameliorating or curing certain abnormal or rverted sexual tendencies and improving the mental ndition and character of the individual; (*b*) with object of eradicating or preventing the spread of ntal defect. The first of these objects would not attained by the comparatively simple operations ntioned, and the committee regard the evidence to individual improvement from the more serious erations of removal of the testes and ovaries as onclusive. With regard to the racial effect of rilisation in preventing mental deficiency, they aw attention to the following points. Excluding ses of mental defect which are not germinal in origin, t which are a consequence of accident or disease ing directly on the individual and are not trans- ssible, the weight of the available evidence is to effect that although the fact of the transmission mental defect by mentally defective parents is doubted, a proportion only of mental defectives are offspring of obviously defective parents. The jority are either the children of parents who appear be normal, although frequently "carriers," or of those suffering from insanity, psychoneuroses, or a mild degree of mental or physical abnormality which is not certifiable. It consequently follows that even were all certifiable defectives sterilised, mental defect would not be eradicated, and its prevention would only be effected to a partial extent. This fact would not in itself justify rejection of the proposal; for obviously partial prevention is better than none at all. There is, however, another aspect of the question. A large proportion of mental defectives, as a consequence of their defect, evince such marked anti-social propensities or social incapacity as to render institutional care necessary. This necessity would be in no wise lessened by their sterilisation, and since adequate segregation is at once an effective preventive of propagation and the best means of dealing with the social failings of the individual, it is regarded by the committee as a preferable procedure. Further, sterilisation of certifiable mental defectives might lead to a false sense of security and result in a large number of defectives who should be segregated being set at liberty. Sexual assaults, promiscuous sexual intercourse, and a direct increase in the incidence of venereal diseases and their sequelæ might be expected to ensue.

The committee add a note regarding the operation of sterilisation laws in the United States of America, where such laws have been enacted since 1907 in 15 States. In five of these the law has been declared to be unconstitutional; in one (New York) it has been definitely repealed; in four the law is practically a dead letter; in three it is still being used, but only to a very limited extent; and in two only (California and Nebraska) is it said to be made use of at all extensively. The largest number operated upon has been in California (2558 cases); these have been chiefly males, who were at the time inmates of State institutions, and no particulars are available regarding their subsequent career.

As an outcome of the report of this medical committee, the members of which include Dr. G. A. Auden, Dr. Helen Boyle, Dr. H. B. Brackenbury, Dr. Cyril Burt, Dr. R. H. Cole, Dr. W. H. Coupland, Lord Dawson, Colonel F. E. Fremantle, M.P., Dr. F. A. Gill, Dr. G. B. Griffiths, Sir Frederick Mott, Dr. C. S. Myers, Dr. W. A. Potts, Dr. F. C. Shrubsall, Dr. A. F. Tredgold, Dr. F. D. Turner, and Dr. Meredith Young among others, the Central Association for Mental Welfare has formed the following conclusions: (1) That segregation is the best method of dealing with certifiable defectives who cannot adapt themselves to the existing social code; and (2) that judicious and kindly supervision is the best method of dealing with those not possessed of marked anti-social propensities. It is considered that these are the foundations upon which a satisfactory national scheme for dealing with the problem of mental defect may be built up.

LINITIS PLASTICA.

Dr. Albert F. R. Andresen[1] of the Gastro-Enterological Department of the Long Island College Hospital, who reports two illustrative cases in women aged 38 and 57, in whom the diagnosis was confirmed by autopsy, remarks that the term linitis plastica was first used by Brinton in 1854 to describe a diffuse increase in the connective tissue of the stomach and characterised clinically by an insidious onset, slowly progressive cachexia, and fatal termination. The most exhaustive study of the disease since Brinton's time was made by H. M. Lyle in 1911, who collected 131 cases from the literature to which he added one of his own. Linitis plastica is a disease occurring in persons of the carcinoma age, nearly all the cases on record being between the ages of 40 and 60. Males are affected twice as often as females. Usually there is some previous history of ætiological significance, such as cardio-vascular disease, alcoholism, gastric ulcer, syphilis, tuberculosis, or occupational trauma. The symptoms are not characteristic but are merely those of the achylia gastrica which is usually present, and consist in anorexia, nausea, upper abdominal discomfort or pain, vomiting, alternate constipation and diarrhœa, and more or less intense secondary anæmia. Hæmatemesis is rare. A feeling of fullness after ingestion of even small quantities of food is very suggestive, being a direct result of the actual diminution in size and loss of elasticity of the walls, as is also vomiting or regurgitation of any excess above a certain amount. Ascites may develop later. In advanced cases a sausage-like tumour may be felt lying transversely in the epigastrium. On inflating the stomach or injecting water into it through a tube the air or water may be felt gurgling rapidly through the tumour. Test-meal examination shows the rapid emptying of the stomach and the absence or reduction of hydrochloric acid. Fluoroscopic examination reveals a small hypermotile stomach, the barium mixture passing rapidly across the upper abdomen and filling the intestinal coils. The prognosis is not good, as even after removal of the gastric focus there may be progressive changes in the colon, rectum, and small intestine, causing stenosis. The average length of life in the benign cases is four years, and in the malignant two years. Treatment consists in gastrectomy, either primarily or in advanced cases, after a primary jejunostomy to improve the patient's nutrition sufficiently to make him fit for operation. In cases where the pylorus is sufficiently patent to admit the passage of a tube duodenal feeding is indicated before the operation.

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[1] American Journal of the Medical Sciences, June, 1923.

"LEAVING IT TO NATURE."

WHEN there is a miscarriage of justice and an innocent person is in prison for many years, the community to which he belongs stands aghast in sympathetic horror. Medicine being a far more complicated matter than the law, it is, unfortunately, inevitable that serious medical errors—some only errors of omission—are often made, condemning the victim to years of invalidism and misery. Of late years there has been a healthy movement in this country as well as on the Continent to shun the omniscient pose and to reduce the incidence of future blunders by giving past blunders publicity—or as much publicity as the courage and conscientiousness of the blunderer permit. In *Le Scalpel* for June 16th Dr. de Harven, of Brussels, has recorded an instructive case which is probably not unique. The patient was a woman, aged 52, who had given birth to three infants, and whose last confinement 15 years earlier had been followed by severe puerperal fever. She was confined to bed by this illness for six weeks, and the vaginal discharge continued to be profuse and purulent; she suffered from general weakness and amenorrhœa. Exactly a year after her last confinement the purulent discharge suddenly ceased, the abdomen became painful, particularly in the left iliac fossa, and there was a rise of temperature. The practitioner who was consulted diagnosed a hernia; his offer to operate on it was rejected. At this stage the patient herself could feel a hard, painful swelling, of the size of an egg, above the pubes, a little to the left of the middle line. This swelling was evidently the uterus distended by pus, which, owing to obliteration of the cervical channel, could not escape as before through the vagina. The patient was very ill and emaciated at this stage, but she gradually became a little better, being able to drag herself about. She could not run or exert herself in any way; even slight movements provoked abdominal pain, and merely walking upstairs distressed her. For 14 years she dragged out this painful existence, the slowly growing tumour in the abdomen becoming more and more troublesome and painful. While she was convalescing from an attack of influenza, she suddenly experienced excruciating pain in the abdomen, and during the next few days there was incessant vomiting with fever and other alarming signs. After this state of affairs had lasted seven weeks and she was practically moribund, she was seen for the first time by Dr. de Harven, who fou a swelling, as large as an adult's head, in the low abdomen and in the middle line. It was dull percussion and tender. The cervix was small a hard, and there was no discharge from it. (laparotomy the swelling was found to consist of t much distended uterus which was adherent to t anterior abdominal wall. The Fallopian tubes we normal, and the ovaries were small and hard. Detac ment of the adhesions between the uterus and t abdominal wall set free a veritable flood of gre creamy pus, containing streptococci, and there prov to be more than a litre and a half in the uter Subtotal hysterectomy was performed, and thou recovery was complicated by severe suppuration, s ultimately recovered, being restored to compl health—after 15 years of misery. Apparently t influenza had stirred the streptococci into renew activity, and the agonising pain experienced so weeks before the operation was evidently due perforation of the uterus. Fortunately the p became localised by adhesions and did not spre throughout the abdominal cavity. The walls of t uterus were about five times as thick as normal a had undergone fibrotic changes. Within this der fibrous capsule the lymphatics of the uterus h evidently been compressed, and thus the enormo bag of pus within the uterus had become effectiv isolated, and the uterine appendages had remain practically normal. It is probable that the pati had acquired considerable immunity to the invadi streptococci, for without such immunity she cou hardly have survived the severe suppuration follo ing the operation.

OPHTHALMOLOGICAL TRAINING FOR MEDICAL STUDENTS.

WE have received from the Council of Briti Ophthalmologists details of correspondence whi passed between that Council and the Registrar of t General Medical Council in the first half of the prese year. In March the Council of British Opthalm logists drew the attention of the General Medi Council to statements in the final report of the Depa mental Committee on the "Causes and Prevention Blindness," which had recently been published, to t effect that the "inadequate knowledge of diseases the eye possessed by the large majority of the medi profession on admission to the Register" is larg due to the limited training in this subject which th receive as medical students, that few universities a examining bodies in Great Britain require candida for a qualifying degree or diploma to be examined ophthalmology, and that although questions ophthalmic surgery are occasionally included in paper, or in the oral examination, these cannot considered as an adequate test of the candidat knowledge of this subject. The Committee furtl stated that in their opinion no licence to pract medicine should be granted without satisfact evidence of an adequate knowledge of diseases of t eye. The Council of British Ophthalmologists point out that this recommendation of the Departmen Committee coincided with their own previou expressed views, and encouraged them again to u the General Medical Council to insist, by means of examination in ophthalmology, on a uniform stand of knowledge in this subject. The General Medi Council's ruling of May, 1919, laid it down that eve student should be required to attend a course practical instruction in ophthalmology of not less th 10 weeks' duration, and that no student should admitted to the final examination unless he produ a certificate testifying to such attendance and t satisfactory standard of work. To this the Council British Ophthalmologists objected on the ground th the arrangement left the evidence of satisfact work entirely to the discretion of the ophthalm surgeon in charge, and that in the London medi schools the evidence of satisfactory work was receivi very different interpretations. "In one school eve student is now required to pass an examination bef s certificate is signed, in others mere attendance in a ophthalmic department is recognised as sufficient." ais difference, they stated, engendered a feeling of justice amongst students of different schools, and as unsatisfactory from the point of view of uniformity the standard of requisite knowledge. The experi- ce of the Irish universities and colleges showed at there was no great difficulty in conducting examination in ophthalmology as an intrinsic rt of the final examination for degree or diploma. fter the recent Summer Session of the General edical Council, the Registrar informed the Council British Ophthalmologists that their letter had been nsidered by the Examination Committee of the uncil, and that the greater part of the communica- on was printed in full in the report made by that mmittee to the Council on June 1st.

Among the recommendations of the Committee lopted by the Council were the following :—

> That the Ministry of Health be informed that on May 25th, 22, the Council made certain recommendations to the censing Bodies for the improvement of the medical curriculum, e of which was that each student should receive instruction, ter alia, in the diseases of the eye, refraction, and the use the ophthalmoscope. The Council thereby anticipated the shes of the Departmental Committee as set forth in their port, which was not published until the autumn of that year.
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> That the Council of British Ophthalmologists be informed at it is too soon to judge of the effect of the resolution recently opted by the Council.

It was stated in evidence before the Departmental mmittee that some of the worst results of ophthalmia onatorum occur in cases which have from the ginning been under the sole charge of a medical actitioner. It may be left to the General Medical uncil, acting with the vigilant assistance of the uncil of British Ophthalmologists, to terminate the ndition of affairs which allows such a statement to made.

LEVENTH INTERNATIONAL PHYSIOLOGICAL CONGRESS, 1923.

Sir Edward Sharpey Schafer, presiding at the leventh International Physiological Congress, held Edinburgh this week, noted that the several eeches of welcome, addressed to the delegates by aptain Elliot on behalf of the Government, by the ord Provost on behalf of the City, and by the incipal on behalf of the University had become ogressively more intimate, beginning with the untry at large, passing to the city of Edinburgh, d ending with the University. It was his duty and easure, he said, to tender the most intimate welcome all, that of British physiology. They had before em a counterfeit presentment of the greatest of all ritish physiologists—William Harvey—and the esident asked their acceptance, as a memento of the casion, of a medal which had been designed from is bust by Mr. Pilkington Jackson, who had also odelled the bust from Harvey's authentic portraits. e President desired especially to associate the name Lister with the gathering in Edinburgh, partly cause he was for several years professor of surgery the University, but chiefly on account of the fact at the researches which preceded his great discovery ere researches in pure physiology and were inspired that great teacher William Sharpey, who migrated 1836 from Edinburgh to London and to whom the eaker and many other British physiologists owed, rectly or indirectly, their introduction to the science. cidentally it was of interest that both Harvey and arpey were born in the same town, Folkestone, though at an interval of more than 200 years. The esident then welcomed the members of the Congress behalf of the countrymen of Harvey and Sharpey d Lister, and noted with regret the loss of 22 workers physiology or allied subjects who had died since e last Congress was held, among them being F. A. ainbridge, Wilhelm Hofmeister, François Franck, d Augustus Waller. It was fortunate, he said, at the president of a physiological congress was not pected to give an account of the progress of the ience since the preceding meeting. The task would, indeed, be a difficult one in view of the complexity of the science and the small part of it any one person could be expected to master. There was, however, a particular subject which was arousing an extraordinary amount of interest, not only amongst physiologists and physicians, but amongst the general public. The subject concerned the internal secretion of the pancreas and was especially connected with the activities of the Toronto School. On this account the Committee of the Congress had invited Dr. J. J. R. Macleod, the distinguished professor of physiology in the University of Toronto, to lecture to the Congress on Insulin. The President then invited Prof. Macleod to read his address, of which an abridged version will be found on p. 198 of our present issue.

THE ADMINISTRATION OF THE VACCINATION ACTS.

THE present epidemic of small-pox in parts of the country emphasises the importance of securing the proper administration of the Vaccination Acts, and the necessity of ensuring that exemption from vaccination is only obtained in conformity with the law. The Minister of Health has issued to boards of guardians a statement of the legal provisions in this connexion ; cases have been brought to his notice in which statutory declarations of conscientious objection to vaccination have been accepted by vaccination officers, although they have been made by some person other than the legal guardian of the child, and various other irregularities have occurred which, he is advised, render the statutory declaration of no effect. In some districts the prosecution of defaulters has entirely ceased. The statement points out the following facts :—

> In ordinary circumstances the father is the person having the custody of a legitimate child, and the obligation therefore rests upon him unless, by reason of his death, illness, absence or inability, or for any other cause, the mother or some other person has the custody of the child. The Vaccination Act of 1907 provides that no parent or other person shall be liable to any penalty under Section 29 or Section 31 of the Vaccination Act of 1867 if within four months of the birth of the child he makes a statutory declaration that he conscientiously believes that vaccination would be prejudicial to the health of the child, and within seven days thereafter delivers or sends by post the declaration to the vaccination officer of the district. It is clear, therefore, that if the father has the legal custody of a child and neglects to cause the child to be vaccinated, he is not exempt from penalty unless he himself makes a declaration of conscientious objection.

The Minister considers it important that vaccination officers should be accurately informed as to the law on this point, and that the responsibility of parents and guardians should be made absolutely clear. The statement also points out that a vaccination officer should scrutinise every statutory declaration which he receives with a view to satisfying himself that the declaration is in all respects in order, and that the duty of taking proceedings for enforcing the provisions of the Vaccination Acts is imposed upon vaccination officers without any directions from the Ministry or the guardians, but it enjoins that the guardians should ascertain from time to time whether those officers are performing these duties, and report to the Minister any case of continued neglect on the part of a vaccination officer. In present circumstances the Minister considers it essential that proceedings should be taken in every case of default.

An Order has been made under the Vaccination Acts prescribing a new form of notice of the requirement of vaccination, in substitution for Form A contained in the First Schedule to the Vaccination Order (No. II.), 1907. The effect of the Order is to eliminate from Form A the form of statutory declaration, and to provide that forms for this purpose may be obtained from vaccination officers. The Order will come into operation on Sept. 1st next, and the necessary forms will shortly be forwarded to registrars of births and deaths, and to boards of guardians for distribution to vaccination officers.

Modern Technique in Treatment.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

XXX.—THE TREATMENT OF THE HYPERTROPHIED PROSTATE.

A man with a hypertrophied prostate presents a more difficultly soluble problem in treatment than a superficial examination of his condition would lead us to expect. On the one hand, it has now been indisputably proved that the average expectation of life is greater amongst those patients who submit to operation under modern conditions, whilst, on the other, it cannot be denied that there is an immediate mortality which is probably larger than we are apt to recognise, our judgment being influenced on the favourable side by the perusal of the results of a very limited number of master operators. The prostatic's troubles are at first purely a local mechanical disturbance of bladder action, but when the kidneys become damaged by being compelled to secrete against great pressure, a disturbance of function of every vital organ in the body supervenes. There is a toxæmia from imperfect elimination, from the effects of which no tissue can escape. The kidneys are damaged most, so that there may not be the slightest reserve on which to call to face the exigencies of the most simple operative procedure. The muscular power of the heart is diminished, whilst the lungs, partly from the lowered circulatory efficiency, and partly from the depressed power of resistance, which they share in common with all other tissues, are prone to suffer from infective lesions. The prostatic is a generally ill man, and often, despite his apparently healthy condition, is living precariously on the brink of a catastrophe, which may be precipitated, only too surely, by ill-timed or ill-advised surgical treatment.

The Choice Between Catheter Life and Operation.

Since it is exceptional for a catheter to be used for any length of time with impunity, catheter life should never be recommended, unless there is some very serious and irremovable objection to operation, such as the presence of diabetes, advanced heart disease, carcinoma, hemiplegia, or other grave illness.

At what stage of the disease does it become necessary to advise operative treatment, or, as the case may be, catheter life? The answer to this is: 1. When the obstruction to the passage of urine has thrown such a stress upon the bladder musculature as to cause it to lose its power of obliterating completely the lumen of this viscus, and of closing the orifices of the ureters during micturition. This is usually the case when the residual urine amounts to about three ounces. 2. When the patient's health is being undermined by being awakened from sleep at frequent intervals for the purpose of micturition, a condition of bladder irritability which is sometimes set up by a prostatic adenoma still small in size and not causing very great urinary obstruction. Where the residual urine is only one or two ounces, relief may be given to the patient if he follows a careful régime, avoiding exposure to cold and damp, and the use of alcohol and highly flavoured foods; he must not overwork and must have a sufficiency of sleep. But always before acceding to this line of treatment it must be determined by appropriate tests that serious general damage has not already taken place.

If, perforce, catheter life must be installed, it is preferable that the patient should have a male attendant who can carry out the necessary manipulation with all regard to aseptic dictates; but should this not be possible, the patient should receive meticulous instructions in the technique of catheterisation. Gum-elastic coudé catheters are the best. When there is little residual urine and a fair power of expulsion remains, two passages of the catheter in 24 hours will suffice, one immediately befor retiring to bed. After use the catheters should b washed, drained, dried, and placed in a tube, i the bung of which is a compartment containin paraform powder, for 24 hours. Therefore two, o better three, sets of catheters, should be provided Another method of sterilising, about equally effectiv and equally troublesome, is by boiling. The ne gum-elastic catheters will stand boiling for a shor time, 1–2 minutes. A portable boiler in which th catheters hang suspended can be obtained. As lubricant a jelly containing tragacanth and oxycyanate of mercury is recommended. This can b obtained sterilised in collapsible tubes. When ther is no voluntary power of passing urine, so that man catheters are necessary, or when the passage of catheter is impossible or painful for the patient, it i better to make permanent suprapubic drainage unde local anæsthesia, and to provide him with an attachment for collecting urine. In most patients th consideration of operative removal comes to the fore

Examination Preliminary to Prostatectomy.

In connexion with the actual operation of prostatectomy there are certain outstanding features. Th bleeding cannot be controlled exactly as it can, fo instance, in a gastro-jejunostomy, whilst the tota amount of blood shed cannot be foretold; a rathe ragged cavity is left, during the healing of whic necrosed tissue must be absorbed and throw a strai upon the excretory organs; sepsis of the cavit inevitably occurs, though to a variable degree. W must, therefore, determine, as far as we can, th reserve powers of two great systems, the circulator and excretory. Will the heart be able to maintai the circulation after the loss of blood which mus occur in connexion with the operation? Are th kidneys working up to the limit of their capacity o will they be able to carry on when the autolyse products of destroyed tissue are absorbed into th blood-stream? Will the immunity response of th patient be equal to dealing with the inevitabl infection? We have no direct measure of the powe of defence to infection, but we can carry out investigations which will help us to judge of the efficiency o the circulation and excretory apparatus. We shoul try to ascertain: (1) The reserve power of the heart (2) the hæmoglobin value of the blood; (3) th blood pressure; (4) the quantity of urine passe in 24 hours and its specific gravity; (5) th reserve power of the kidneys. An index of th resources of the heart is the reaction of the patien to exertion, the presence or not of dyspnœa after moderately sharp walk or on going upstairs. W can get no exact measurement of this function i reserve; we can only arrive at a clinical impressio Loss of blood will mean increased work for th heart. The higher the blood pressure, the less abl will the heart be to respond. The toxæmia whic results from the damage to the kidneys, as in chroni interstitial nephritis not dependent upon disease the prostate, affects the bone-marrow and interfere with the birth of new red corpuscles. The patient i doubly handicapped to withstand a hæmorrhage; h suffers from anæmia to begin with and is cripple in his efforts to replace the lost red corpuscles. the hæmoglobin percentage is below 60, it is a risk procedure to attempt a prostatectomy. Polyuria wit low specific gravity and low urea content points t the existence of chronic interstitial nephritis. B flooding the circulation with urea and thus throwin a strain upon the kidneys we are able to estimat their reserve power. H. Maclean's urea-concentratio test is the simplest, most practical, and most reliabl method of doing this. If, in response to this test, th kidneys are able to secrete urine containing 1·5 p cent. of urea, they are not likely to fail after operatio and a considerable number of cases can be operate upon, other factors being favourable, if the percentag of concentration is down even to one. The pheno sulphonephthalein test of renal function is als useful, but is less simple and reliable.

The Institution of Preliminary Drainage.

If the tests are unfavourable to operation, it is ssible to improve the patient's condition so that ntually he may be submitted to it without undue k. The secret of such treatment is to relieve the essure against which the kidneys have to secrete, ving the prostate in situ. This is done by an dwelling catheter, or by suprapubic drainage. It astonishing what recovery will take place from this atment. A catheter should be tried first. Suprabic drainage should be instituted (1) if catheterisan is impossible; (2) if the urethra will not tolerate in-dwelling catheter; (3) if there is much urinary sis; (4) if the period of drainage has to be a olonged one. Ten days or a fortnight of drainage ll often suffice materially to improve the ureacentration figure, but sometimes a delay of several nths is necessary before prostatectomy can be ely undertaken. A word of caution must be given out the management of cases where there is much idual urine or overflow incontinence. Evacuation the bladder must be gradual or uræmia may quickly low. In such patients either a catheter should be ssed every four hours and a pint of urine withdrawn til the bladder is empty, when a catheter may be d in, or, what amounts to the same thing, a catheter tied in the urethra and the plug removed every four urs to evacuate the same amount. Should suppresn of urine follow a too rapid emptying, the mptoms of uræmia may be induced to disappear by ing up the bladder again with boric lotion.

Certain complications, such as retention of urine, morrhage, and epididymitis, may occur in the ostatic; space forbids discussion of their treatent. For retention a hot bath, with hypodermic morphine gr. $\frac{1}{6}$, should first be tried, followed by ntle attempts at catheterisation; aspiration above e pubes or the insertion of a self-retaining catheter to the fundus of the bladder are last resorts. Rapid moval of urine is dangerous.

The Choice of Method for Removal of the Prostate.

It is not possible to say at present which is the tter of the two methods; advocates of both exist d almost equally good statistics have been published. e suprapubic operation is certainly easier and the sults are in the main good. In the hands of experts e perineal operation appears to show a slightly lower ortality and to afford better opportunity of controlling morrhage; certainly drainage of the septic prostate vity is more efficient. The two great drawbacks cited ainst the procedure, incontinence and urethro-rectal tula, disappear with the increasing skill of the expert. e presence of a stone in the bladder, discovered by stoscopy, which should always be performed when acticable, indicates the suprapubic route.

The Results of Prostatectomy.

The urinary fistula, perineal or suprapubic, is ually closed within three weeks and the patient turns to a state of health unknown to him for ars. Some patients, however, still complain of a rtain nocturnal frequency of micturition. A much ore troublesome condition is the persistence of sepsis, m which the patient never recovers. In such lividuals it is probable that the kidneys were dly infected at the time of the operation. Not ry commonly a stricture follows the enucleation of prostate. The obstruction is sometimes at the angular ligament, at others at the bladder base, and ay need a cystotomy for its proper treatment. On e whole, however, it may be said that the ultimate sults of removal of the prostate are extremely good. ey are incomparably better than partial excisions ne by intra-urethral instruments. Recently a revival such incomplete removal has taken place, substiting the diathermic cautery for the punch or actual utery. It would be premature to criticise the results such a recent technique, but the indications are that, e the older methods, it has only a limited application.

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Special Articles.

BRITISH MEDICAL ASSOCIATION.

ANNUAL MEETING AT PORTSMOUTH.

THE annual summer gathering of the British Medical Association opened under ideal weather conditions at Portsmouth on Friday, July 20th, when the Representative Body held its first session in the Municipal College, adjoining the Town Hall.

CIVIC WELCOME.

At an early stage in this session the Lord Mayor of Portsmouth, Alderman F. G. **FOSTER**, attended to bid hearty welcome to the Association. He was introduced by the President-Elect, Mr. C. P. **CHILDE**, F.R.C.S., who pointed out that it was the Lord Mayor to whom, as chairman of the Education Committee, the loan of the College was due. Mr. Childe also introduced Mr. C. A. **SCOTT RIDOUT**, F.R.C.S., hon. local general secretary, as the pivot on which the whole meeting was to revolve. Alderman Foster said that it was his brother, the late Sir Scott Foster, who had extended the civic welcome to the Association at its last meeting at Portsmouth in 1899. He spoke of the growing public interest in health during the intervening 24 years, telling of the local wiseacre who complained of "that fool of a medical officer sniffing round, when here I have been living in Milton for 40 years and never seen a microbe." Dr. R. **WALLACE HENRY**, chairman of the Representative Body, said that the Association had three great aims: first, the consolidation of medical knowledge and the finding of new methods by which disease might be cured and its incidence prevented; secondly, to discover the best methods by which advances in medical science might be passed on to the public; and thirdly, to secure to those engaged in the work such conditions, economic and other, as would free them from needless anxiety and enable them to put forth their best work. It had been said that good work was its own reward; he would add that better work came from better reward.

REPRESENTATIVE MEETING, FRIDAY, JULY 20TH.

Dr. **WALLACE HENRY**, of Leicester, took the chair at 10 A.M. After apologies for absence and the acceptance of certain modifications in the standing orders, Mr. J. Basil Hall, M.Ch. Camb., was elected President of the Association for 1924–25, the annual meeting of 1924 to be held at Bradford. The annual meeting of 1925 was fixed for Bath. Sir David Drummond, president in 1921–22, was elected a vice-president, as also Mr. G. A. Syme, M.S., of Melbourne, chairman-elect of the Australasian Medical Congress, Dr. R. H. Todd, of Sydney, Dr. H. E. Gibbs, hon. secretary of the New Zealand branch, Dr. W. Watkins-Pitchford of Johannesburg, and Dr. D. C. Watt of Pietermaritzburg. It was announced that Sir William Macewen was going in November as ambassador to the Australasian Congress.

PUBLIC HEALTH POLICY OF THE B.M.A.

The meeting at once settled down to consider the relations between the British Medical Association and the Society of Medical Officers of Health. These had been under discussion since the Cambridge meeting in 1920, and the negotiations had resulted in the drawing up of a definite scheme described by Dr. R. A. **BOLAM**, chairman of the B.M.A. Council, as an agreement between the medical profession as a whole and those who have the duty of carrying out public health functions under authority. There is at present no provision in the constitution of the Association for ensuring that the opinions of members working as whole-time officers for public health authorities shall be made known directly to the Association, and the B.M.A. Council, in the course of its investigations, became convinced that it would be for the good of all if representatives of the public health service were brought into direct contact with people doing other kinds of medical work. First, the report of a conference of representatives of the two bodies was submitted for the approval of the meeting. This report runs as follows :—

Report of Conference between B.M.A. and Society of M.O.H.'s on Public Health Medical Services.

I. The Conference has reviewed the obligations and powers imposed and conferred upon local authorities by Acts of Parliament in regard to health administration and the relative position of medical officers of health and general practitioners in schemes of health services. These obligations and powers include :—

(*a*) Medical survey or inspection.

(*b*) Treatment.

II. Local authorities must give effect to their legal obligations. The extent to which they exercise their powers is in the discretion of the local authority subject to the prior approval of the appropriate central Government department. The Conference is of opinion that benefit would be likely to result from a closer coöperation of the local medical profession with the local authorities' schemes of medical survey or inspection and treatment.

III. The Conference is in general agreement with the view of the Consultative Council on Medical and Allied Services as stated in that part of paragraph 6 of its interim report which recited :—

"Preventive and curative medicine cannot be separated on any sound principle and in any scheme of medical services must be brought together in close coördination. They must likewise be brought within the sphere of the general practitioner, whose duties should embrace the work of communal as well as individual medicine."

Advice to Local Authorities.

IV. The Conference is therefore prepared to advise local authorities :—

(1) That where private general practitioners place their opinions before local authorities on any proposed scheme of medical survey or inspection and treatment, their representations should have due consideration by the local authority in order that it may be ascertained how far it is practicable or desirable to give effect to their view.

(2) That those engaged in general practice must either be prepared to accept responsibility for the treatment of such of their private patients as are discovered by medical survey or otherwise by the local authority to be in need of treatment, or they should agree that treatment should be undertaken by the local authority without regarding such medical provision as an encroachment on their practice. To this end persons found to be in need of treatment should, in the first instance, be referred to their private medical practitioner, or if they have no regular medical attendant they should be advised to consult a private medical practitioner.

(3) Private practitioners should assist local authorities by intimating their willingness or otherwise to undertake the treatment of patients discovered in the manner stated to be in need of treatment.

Centres and Clinics.

V. That practitioners, and by arrangement medical students, should have access to centres and clinics established by local authorities, in order that they may gain such experience as the centres and clinics afford.

VI. That private medical practitioners should be able to refer to clinics and centres for advice and treatment patients who would thus be most appropriately provided for.

VII. That payments or charges, if any, made in respect of medical treatment should be either voluntary or of such a character as will not deter persons from seeking advice and obtaining early treatment.

VIII. Centres and clinics should be established and administered for the benefit of :—

(*a*) Those who are unable, for some reason, to obtain treatment from a private doctor, and

(*b*) Those who, as a result of supervisory medical work undertaken by the local authority, are discovered to be ailing, and for whose ailments treatment would not be sought unless it were provided by the local authority.

But treatment at centres and clinics should be such as can be actually given therein, and should not include any treatment that makes domiciliary attendance advisable or involves a stay of more than 48 hours at any clinic where beds are provided.

Treatment by Private Practitioners.

IX. The Conference is of opinion that in the interests of harmonious working and the acquirement of clinical experience, the possibility should always be considered of clinic work done for the public health authority being carried o through the agency of private practitioners where conditio are suitable.

X. For the purpose of a better understanding, t Conference desires to state further :—

(1) That private general practitioners or consultan accepting offices under local authorities must realise that t duties of these offices require to be fulfilled strictly accordance with the conditions of the appointments and priority of all other engagements.

(2) That the health policy is settled by local healt authorities, not only on medical grounds, but after due rega has been given to the closely-related questions of admini tration and finance, local conditions and other releva considerations.

(3) That the medical officer of health should so far possible secure the coöperation of the local medical professio in the discharge of his duties.

(4) That the final decision of the health policy must alwa rest with the local central authorities.

(5) That it is the duty of the medical officer of health ensure that effect is given to the decisions of those authoritie

Scheme for Coöperation with M.O.H.'s.

This report was agreed to without further discussio Dr. Bolam then proposed certain alterations in t constitution of the B.M.A., involving correspondin alterations in the constitution of the Society M.O.H.'s, the whole being a contingent agreeme which precluded the Society of M.O.H.'s fro independent medico-political action. The recomme dations of the B.M.A. Council were as follows :—

I. (*a*) The B.M.A. so to alter its constitution as allow of the *direct* representation of such of its membe as are in the Public Health Service, on its various governin bodies ; and

(*b*) The Society of M.O.H.'s so to alter its constitution to allow of the Association being directly represented on t Council of each branch and on the Central Council of t Society.

Note.—It is eminently desirable that the representatives the Council of the Association, or Society, should be members the other Council.

II. The Society of M.O.H.'s to continue to formulate an urge any medico-political policy that it wishes, and whe such policy is of mutual concern to both the Society and t B.M.A., the Society will present that policy to the Associatio through its direct representatives, and when any such medic political matter has been finally determined by the annu representative meeting all action consequent thereon sha be taken by the B.M.A. The Society shall refrain from takin any action in support of a divergent policy until after t decision of the annual representative meeting, but in t event of the Society thereafter feeling constrained to co sider the taking of separate action, such action shall n be taken until the Councils of the Association and t Society have conferred together thereon.

III. As a condition of, or preliminary to any agreeme on the above lines, *if desired*, a common declaration of polic on general lines to be promulgated by both Association an Society, and a common arrangement in general terms as certain points with regard to salaries and the method securing them to be agreed upon.

Prolonged discussion took place on this schem started by an amendment from Brighton, disapprovin of any alteration in the constitution of the B.M. which would secure for certain of its members du facilities for voting and representation. The Associa tion, it was argued, had been built up on an individu basis, and to change this was to go back on th democratic attitude of 1902. If 1800 public healt service members were given special privileges, th same would be claimed by other groups such Poor-law, insurance, medical women, service branche and so on. The B.M.A. Council frankly admitte the small sacrifice of democratic principle involve in the bargain, but justified it as the only practical wa of preventing the public health medical service fro ploughing its own lonely furrow or combining fo political action with administrative branches of th health service. The meeting agreed with the Counc by refusing the Brighton amendment and passing th change in constitution by the necessary two-third majority.

cale of Minimum Salaries for P.H. Medical Officers.

A definite scale[1] of minimum commencing salaries medical officers in the public health service was en put to the meeting by the chairman of the M.A. Council. This scale differs substantially m that submitted at Cambridge in 1920. In its rlier form current civil service bonus and yearly reases were integral portions of the scheme. view of the present economic position these are w accepted as guiding principles but are not ligatory. The minimum commencing salary for a ior officer has been meanwhile raised from £500 £600, inasmuch as it was shown that progressive alth authorities were now requiring evidence of ecial experience before a practitioner could hope get on the short list for one of the junior appointnts. The M.O.H. of a large county, with a staff nearly 30, stated that the average age of his iors on appointment was nearly 40, and that ly one of them (appointed during the war) was thout special experience on appointment. The M.A. Council came to the conclusion that if this ecial experience was to be made a sine qua non appointment, it could not be suggested that £600 s an extravagant salary, particularly as the ospect of advancement is poor. The scale as now oposed also differs in the greater differentiation in salaries for the chief M.O.H., to begin at £800 for a pulation of under 35,000—the great bulk of appointnts being between £800 and £1100.

Dr. BOLAM, in moving this scale, pointed out again at much had been said regarding £600 as a comncing salary for a "young raw graduate," but this m no longer described the public health service trant, for he or she must be fully qualified (six years) plus the D.P.H. plus special experience in some department—e.g., tuberculosis, school hygiene, M. and C.W., and was then years removed from qualification. The chances of getting £1000 or over in the service were small; he put them at 1 in 8 (wishing to be moderate); Dr. C. SANDERS at 1 in 14. The motion was carried by the necessary two-thirds majority. The Council then accepted an instruction to meet representatives of local authorities and to make such alterations in detail as might be necessary to secure an agreed scale.

Amendments in the by-laws were then passed rendered necessary by the decision to admit direct representation of public health service members on the governing bodies of the Association, the following interpretation being accepted :—

> The expression "public health service member" means a member of the Association who is permanently employed in the whole-time medical service (other than service at a lunatic asylum) of the council or education authority of any county, county borough, municipal borough, metropolitan borough, burgh, urban district, rural district, or parish, or port sanitary authority in the United Kingdom.

Medical Defence for Members of the B.M.A.

On a motion by Warrington and St. Helens—

> regretting that the B.M.A. Council had not seen its way to recommend the alteration of the Articles of the Association so that this paramount duty might be undertaken either by the Association itself or by its incorporation with one or

Minimum Commencing Salaries for Public Health Medical Officers.

SIDENT MEDICAL OFFICERS .. .. .. FINITION.—These are Medical Officers emloyed in Hospitals, Sanatoria, or other nstitutions without responsibility for the vork of other Medical Officers. *te.*—Where the Appointing Authority limits he appointment to a term not exceeding one ear and not renewable, this salary shall not pply.		£350 plus emoluments.
DICAL OFFICERS EMPLOYED N DEPARTMENTS. FINITION.—These are Medial Officers without responibility for the work of other Medical Officers, but who shall ave had at least three years' xperience in the practice of heir profession subsequent o obtaining a registrable ualification.	Working directly under a Senior Medical Officer.	£600
IOR MEDICAL OFFICERS IN HARGE OF DEPARTMENTS—.g., Port Sanitation, School Medical Departments, Tuberulosis Departments, Mental Deficiency Departments, Maternity and Child Welfare Departments, Venereal Disase Departments, or any ther similar department or ombination of departments, nd Medical Superintendents f Hospitals, Sanatoria, or ther Institutions. FINITION.—These are Medial Officers who are in charge f departments and are irectly responsible to the Medical Officer of Health or therwise.	Without Assistants.	£750
	With 1 Assistant	£900
	2	£950
	3	£1000
	4	£1050
	5–6	£1100
	and for every completed two or less.	an additional £50
PUTY, OR CHIEF ASSISTANT, MEDICAL FFICERS (Hospitals, Sanatoria, or other nstitutions and Departments).		A salary equal to 60 per cent. of the salary of the Medical Superintendent or Senior M.O. in charge but not less than the salary of a M.O. employed in a department.
DEPUTY OR ASSISTANT MEDICAL OFFICERS OF HEALTH. DEFINITION.—A Deputy or Assistant Medical Officer of Health is a medical officer duly appointed as deputy or assistant medical officer of health by the local authority to assist the medical officer of health in the general administration of the health department and the carrying out of the various Acts, by-laws, orders, rules, regulations, &c., required to be or usually administered by the medical officer of health; the title deputy assistant medical officer of health to be limited to medical officers carrying out these general duties.		A salary equal to 60 per cent. of the salary of the M.O.H. but not less than the salary of next grade of medical officer in the department.

—	Population.	Minimum commencing salaries per annum.
MEDICAL OFFICERS OF HEALTH	Under 35,000	£800
	,, 50,000	£900
	,, 75,000	£1000
	,, 100,000	£1100
	,, 150,000	£1200
	,, 200,000	£1300
	,, 300,000	£1400
	,, 400,000	£1500
	,, 500,000	£1600
	,, 600,000	£1700
	Over 600,000	£1800

Notes.

(A) These salaries are net, any expenses necessitated by the duties being provided in addition.

(B) Population means population at the latest annual report of the Registrar-General.

(C) No existing officer should be prejudicially affected by the operation of the scale.

(D) ANNUAL INCREMENTS should be at the rate of 5 per cent. per annum, rising to 40 per cent. above the minimum basic rates.

(E) BONUS. The current Civil Service cost of living bonus should be applied to the foregoing scales.

(F) That the salaries of Medical Superintendents of Poor-law Hospitals should be as for Senior Medical Officers in charge of Departments as set out above.

(G) That salaries are to be minimum salaries for whole-time service.

(H) That Medical Superintendents of Institutions, and in suitable cases Chief Assistant M.O.'s, should, in addition to their salaries, be supplied with a house.

(I) That there shall be no differentiation of salary on account of sex.

(J) That all exceptional work not recognised as normal duties to the subject of additional remuneration.

(K) That if marriage be deemed by the local authority a disqualification for a medical appointment the same shall be specifically stated when the vacancy is advertised.

(L) That in placing existing officers in accordance with these salaries, years of service and merit should receive recognition.

(M) That all Medical Officers of local authorities should be subject to similar security of tenure as is provided for a Medical Officer of Health under the Public Health (Officers) Act, 1921. But where the appointing authority limits the appointment to a term not exceeding one year, and not renewable, this provision shall not apply.

> more of the existing defence societies; further, that this meeting is of opinion that the individual defence of members in professional matters should be one of the functions of the Association,

Dr. J. S. **MANSON** reminded the meeting that the matter was first discussed in 1896, was the subject of resolutions at Swansea in 1903, and at Newcastle in 1921. The Wood-Hill case had given great impetus to the demand for individual defence. There was a very strong expression of opinion that it was the function of the Association to protect its own members. But the solicitor to the Association pointed out that (1) legally the Memorandum of Association did not include individual defence, and the Home Office would have to be approached for permission to apply to the courts for alteration of the constitution; and (2) existing defence societies were so well established that it was now hardly practicable to get individual medical defence within one fold. The motion was lost by a large majority.

Election of Members of Council.

The election of 12 members of Council by grouped representatives was announced as follows: Dr. G. B. Hillman, Dr. F. Radcliffe, Dr. J. W. Bone, Dr. T. Ridley Bailey, Mr. W. McAdam Eccles, Dr. W. Paterson, Dr. C. E. S. Flemming, Dr. S. Morton Mackenzie, Dr. C. E. Douglas, Dr. J. McGregor Robertson, Dr. R. B. Mahon, Dr. J. S. Darling; all being unopposed except Dr. Flemming and Dr. Douglas.

The meeting adjourned at 6 P.M.

REPRESENTATIVE MEETING, SATURDAY, JULY 21ST.

HOSPITAL POLICY OF THE B.M.A.

On Saturday morning the report of the B.M.A. Council on hospitals was taken, in order to give the meeting an opportunity of discussing the policy of the Association with regard to

Contributory Schemes

of hospital benefit. After an expression of regret at the loss by death of Sir James Galloway, a valued member of the Hospitals Committee, a motion by the chairman of the Hospitals Committee, Mr. N. **BISHOP HARMAN**, to define (for the purpose of the present discussion) a contributory scheme as "a scheme to which contributions are made for which there is to be a stated or implied return," was carried. Mr. Harman showed how wide an interest had been created by hospital policy of the Association enunciated last year at Glasgow. A motion by Buckinghamshire to the effect—

> That unless it can be clearly shown that the amounts collected for hospital benefits by contributory schemes are in excess of the amounts required for the upkeep and maintenance of the hospital, no part of the moneys thus collected can fairly or properly be claimed by the honorary medical staff,

led to animated discussion on the purpose for which the individual pays his contribution; in practice it was generally regarded as impossible to distinguish between payment for maintenance and payment for treatment. The worker's attitude to the hospital doctor was apt to be "We pay 1*d*. a week, we buy *you*." And Mr. H. S. **SOUTTAR** said it was perfectly clear that the contribution was paid "for treatment in hospital." In a genuine contributory scheme Mr. Harman contended there was no difficulty in finding money for both, but the Hospital Savings Association was simply a means of exploiting the medical profession. The motion was lost.

Medical Staff Funds.

Mr. **HARMAN** then moved the amendment of a paragraph in the Hospitals Report so as to read:—

> Income derived from gratuitous contributions, existing assets, endowment funds, and the like, are not liable to assessment for medical staff fund purposes, but all payments made for hospital benefit are, in fact, payments towards all the services of the hospital whether medical or ancillary, and therefore a percentage of such payments should be passed into a fund which is at the disposal of the honorary medical staff of that hospital. Small payments of individual patients not recoverable from third parties may be assessed in a nominal percentage only as a token recognition of th policy enunciated.

"They do, in fact, pay to see the doctor," sai Mr. Harman in his brief introductory statement An amendment was moved by Reigate to the effect—

> That, in the absence of any great body of opinion to sho that the members of the Association, and more particularl members of the medical staffs of hospitals are in favour o the policy laid down in the Hospital Report, the furthe consideration of the policy proposed be postponed until nex annual representative meeting; and the Council be instructe to inquire in the meanwhile of all staffs of hospitals wit 30 beds and over, which of the various sources of income, i any, of a hospital should be required to make a contributio towards a staff fund.

Dr. S. **MORTON MACKENZIE**, in moving postpone ment, said that the policy might be sound, but it wa better to go slow, for many members of voluntar hospital staffs would certainly refuse the "toke recognition" or any other.—Sir **RICHARD LUC** called attention to the difficulties caused by varyin conditions in the North and South. In the North large part of the hospital funds came from workmen' contributions collected at the source and was untaxabl under the resolution; in the South payment wa directly made by patients and could be taxed. Th capitation fee of insurance and friendly societies wa on the debatable margin. He thought the Associatio would not carry the present hospital staffs with them.— Dr. P. **MACDONALD** supported any measure of postpone ment in view of his well-known conviction tha voluntaryism could never supply an adequate hospita service.—Mr. W. **MCADAM ECCLES** opposed postpone ment for the reason that contributory schemes wer springing up all over the country, and it was for th Association to guide public opinion.—Dr. H. **B BRACKENBURY** pleaded for a definition now of sta funds so that returns might be obtained from th hospitals concerned.—Mr. **SOUTTAR** said that ever patient at the London Hospital was now assesse at what he could pay, up to £5 5*s*. a week. Was it th duty of the staff to treat all these paying patient gratuitously?—The President-elect, Mr. **CHILDE** feared that the charitable public, on whom they sti relied much, would withdraw their subscription when they heard of the staff fund. He thought i should not be beyond the constructive powers of th Association to arrange a scheme to provide medica treatment for the class between the poor hospita patient and the well-to-do while maintaining the volun tary principle intact.—Sir **JENNER VERRALL** appeale to the mover not to split the profession on this issue

In the event the amendment for postponement wa carried by 84 votes to 70, and on Dr. Brackenbury' initiative the reasons for postponement were delete from the amendment when passed as a substantiv motion.

Definition of the Voluntary Hospital.

On a motion by Bolton to amend the definition o a voluntary hospital and asking the Association t maintain that "the essential feature of the voluntar hospital system consists in maintenance wholly o mainly by voluntary contributions and is no necessarily related to the conditions of service of th medical staff," the criterion of independent voluntar management was frankly described as the "cha woman definition." Dr. E. J. **TOYE** (Barnstapl insisted that a voluntary hospital is one in which th patient is treated gratuitously. He pictured th learned investigator of the future who unearthed th Bolton resolution being led to the conclusion that th ancient Britons had maintained temples which the called voluntary hospitals and that in these templ they kept gods which they tried to pacify by offering known as voluntary contributions. The Bolto definition was rejected.

Contributory Schemes for Private Insured Persons.

On the invitation of the Brighton Division, whic had sent up a closely reasoned memorandum dealin with contributory schemes for private insure persons, it was agreed without much discussion t er to the consideration of the Council the following ints for definite decision next year with such erim action as was within the present range of its spital policy :—

a) The income limit scale to be such as is approved by the jority of the medical profession resident and practising hin the area of the scheme.

b) Free choice of doctor (attendant and specialist) by ient subject to consent of doctor to act.

c) The scheme to be administered by a general committee resentative of the interests concerned, and not by a untary hospital or other coöperating institution.

d) The method of remuneration of medical specialists to payment for work done.

e) Medical remuneration for specialist's services to be at the local profession considers adequate having due ard to the services to be rendered and other conditions of scheme.

f) Adequate medical representation of the General nmittee administering the scheme with recognition of the rision (Branch) of the British Medical Association as resentative of the profession in the area of the scheme.

g) The accommodation provided for in-patient treatment be at recognised nursing homes, paying hospitals, or in ommodation of the nature of a nursing home in connexion h a voluntary hospital.

hese proposals being based on the fundamental nts adopted for domiciliary National Health surance.

The British Medical Journal.

he B.M.A. Council reported that this year Sir wson Williams completes 25 years' editorship of *British Medical Journal.* It was resolved and ried by acclamation—

> hat this meeting sends its heartiest congratulations to Dawson Williams, upon the completion of his 25 years Editor of the *British Medical Journal*, and wishes him lth and success in carrying on that work.

o signalise the occasion Sir Dawson Williams is to the guest of the evening at the B.M.A. Council ner on Oct. 24th.

Scientific Work of the B.M.A.

n asking for approval of the section of the annual ort under the heading Science, the chairman of Science Committee, Mr. H. S. Souttar, spoke of peculiar character of the Association's research olarships, in that scholars were not required to ote the whole of their time to research, but might d concurrently junior appointments at university hospital. The Council was proposing to make litional grants for approved schemes of post-duate education undertaken by the branches. referred to the valuable work of Mr. W. G. Spencer honorary librarian, and of Prof. R. T. Leiper in paring the "Bibliographical Index." He hoped t the new home of the Association would prove a tre for exchange of scientific ideas. Mr. E. B. rner thought that now war conditions were sing more money should be given by the Association "direct culture." He had been struck by the h qualification and claims of the candidates for olarships.

Representation of Medical Women's Federation on the B.M.A. Council.

 motion was proposed by Dr. Brackenbury and onded by Dr. Christine Murrell (Kensington) to effect—

> hat the Council be instructed to prepare the necessary ration in the by-laws to allow the coöption to the Council member of the Council of the Medical Women's Federa- nominated by that body, and that in the meantime the uncil should invite a representative of the Council of the lical Women's Federation to attend its meetings.

r. Brackenbury said that for many years the W.F. had worked in complete harmony with the .A. on matters of medical policy, and members of M.W.F. had been coöpted on subcommittees of the .A. He regarded the claim for special represen-ion as valid, because (1) the M.W.F. formed a tinct body of practitioners with separate professional erests and ideas, (2) it was sufficiently numerous justify representation, and (3) so scattered that resentation on the usual lines was hardly feasible. t the motion he was putting might be too precise and categorical. Dr. Murrell said that while medical women did not desire as such any special franchise, nevertheless society forced upon them the separate consideration of certain matters, and it was then inconvenient for one council not to know what the other council was doing. Some method was required of solving a practical difficulty. Dr. C. O. Hawthorne (Marylebone) characterised the demand as simply one of sex representation without any element of vocation or reciprocity. A federation of red-haired practitioners would have an equal claim for special treatment. Dr. Mackenzie besought the meeting not to go back on its Newcastle decision to reject a federal basis; it would certainly be a good thing to have a woman elected on the B.M.A. Council, but not for the M.W.F. to have a seat there by right. The Association already had 1300 women members while the Federation had but 800.

By consent of the meeting the original motion was withdrawn in favour of one proposed by Dr. E. W. G. Masterman (Camberwell) and seconded by Mr. Souttar—

> That the Council be instructed to investigate what measures can be taken to ensure some means of representation of medical women on the Council of the Association.

This motion on being put to the meeting was lost by a large majority.

Public Health Matters.

A motion proposed by Dr. C. J. Kirk (Darlington)—

> That the Council of the British Medical Association inform the Ministry of Agriculture and the Ministry of Health that in the opinion of the British Medical Association the Milk and Dairies Act, 1915, and the Tuberculosis Order, 1913, should be brought into operation at the earliest possible date,

was referred for consideration to the Council which was also requested, on the proposition of Dr. H. Rose (Bucks) to call the attention of the Ministry of Health to the urgent necessity of isolating cases of advanced and infectious tuberculosis.

On a motion by Dr. J. W. Bone (Bedfordshire) it was resolved to express regret that "Summer Time" has been curtailed this year, as the British Medical Association is of opinion that it is beneficial to the health of the nation.

Mr. E. B. Turner (Kensington) proposed, Dr. T. W. H. Garstang (Mid-Cheshire) seconded, and it was unanimously resolved—

> That the Representative Meeting restates the policy of the Association, and the practically universal conviction of the medical profession, that vaccination efficiently performed in early infancy, and repeated after such intervals as may be deemed necessary during after-life, is the only certain preventative of small-pox. Owing to the distribution of an enormous number of unvaccinated persons in every part of the Kingdom it recognises the danger of a pandemic of this disease, and therefore urges the Government to take such measures—legislative, administrative, and preventive—as may be necessary to avert this peril from the community and should it do so, assures it of the whole-hearted support of the British Medical Association.

As a corollary to this resolution it was proposed by Dr. Noy Scott (Plymouth), seconded by Dr. H. L. Hatch (Harrow), and agreed that Government lymph should be supplied during an epidemic to all medical practitioners who apply for it and are willing to render a report on the results. Dr. J. A. Macdonald expressed his belief that the Ministry of Health would readily grant this if the claim were pressed.

National Health Insurance.

Under this heading Dr. Brackenbury obtained from the meeting endorsement of the policy and action of the Insurance Acts Committee (see The Lancet, 1923, i., 1226). The meeting firmly refused, by proceeding to the next business, to discuss Dr. Fothergill's amendment to the effect that the organisation of insurance practitioners (set out in a rather famous document known as M. 10) in the event of a refusal of the Government's terms was contrary to the honour and interest of the medical profession. Dr. Brackenbury did not believe that the contingency would arise. The attempt to define the range of general practitioner service came in for criticism, especially in regard to the different abilities of the young and old, but Dr. Brackenbury pointed out that the schedule was not so much a definition of competence as of what an insured person under his contract was entitled to get from the insurance practitioner. An offer in this sense might be made, but it remained to be seen whether the Ministry of Health would accept it or not.

Election of Chairman and Deputy Chairman.

During the sitting the medical secretary announced that only one nomination each had been received for the chairmanship and deputy chairmanship of the Representative Body. Dr. R. WALLACE HENRY and Dr. H. B. BRACKENBURY were accordingly declared re-elected for the year 1923–24.

THE VOLUNTARY HOSPITALS DURING 1922.[1]

Sir Napier Burnett's fourth annual report on the voluntary hospitals in Great Britain (excluding the London area, where the hospitals are under the supervision of King Edward's Hospital Fund) was issued last week. The earlier publication of hospital reports this year has enabled the survey to be issued some three months in advance as compared with the report for 1921. Sir Arthur Stanley contributes a prefatory note, and two addresses by Sir Napier Burnett—the first dealing with contributory schemes as a feature of hospital finance, the second dealing with hospital treatment for middle-class patients, both delivered at the annual meeting of the British Hospitals Association at Sheffield in June of this year—are included as appendices. Chapters II. to VII. review the English voluntary hospitals, and Chapters VIII. to XII. relate to the Scottish hospitals.

Number of Patients Treated.

In Great Britain as a whole (excluding London) 643 voluntary hospitals supplied details of numbers of new patients treated during the year. These hospitals constitute 87 per cent. of the total number of hospitals, with 40,331 available beds (94 per cent. of the total possible); in all, 2,090,855 individual new patients were treated, at a total cost to the hospitals of £4,946,299. Towards this expenditure the hospitals received £4,868,615, leaving a deficit on the year's working of £77,684. The total number of new in-patients treated by the 643 hospitals was 501,945, and the total number of new out-patients 1,588,910. In England the 13 teaching hospitals were responsible for the treatment of 30 per cent. of the total number of patients treated in the 571 hospitals; in Scotland the six teaching hospitals were responsible for 51 per cent. of the total number of patients treated in the 72 hospitals.

Summary of Financial Situation.

During 1922 there was a great improvement in the finances of the hospitals. The excess of ordinary expenditure over ordinary income was £74,978, against £419,138 in 1921. These figures do not include any grants from the Voluntary Hospitals Commission, or free legacies, but refer solely to the ordinary trading or maintenance accounts for the year. Showing the two countries separately, for England and Wales the ordinary income failed to meet the ordinary expenditure in 1921 by £349,929; the corresponding deficit for 1922 was £28,085. In Scotland, in 1921 the deficit was £69,209, and in 1922 £46,893. The financial situation in the case of hospitals in Scotland is in reality much better even than these figures show, because, as is pointed out in the body of the report, the Scottish hospitals receive considerable sums in the form of free legacies year by year, with such regularity, that in a sense these legacies might b regarded as ordinary income. The above detail dealing with the deficit refer to the 666 hospital which forwarded their annual figures. Of the 66 hospitals, 378 (57 per cent.) had an excess of ordinar income over ordinary expenditure of £315,420 whereas 288 hospitals (43 per cent.) had an excess o expenditure over income of £390,398. The corre sponding figures for 1921 were: Total number o hospitals reviewed, 656; of those, 335 (51 per cent. had a surplus of £228,013, while 321 hospitals (49 pe cent.) had a deficit of £647,151. These figures clearl show the progress made during the year. The surplu and deficit figures, as well as the number of hospitals show a remarkable turnover. The progress mad during the past three years is shown by the follow ing percentage figures: In 1920, 44 per cent., in 192 51 per cent., and in 1922, 57 per cent. of hospitals ha surplus of ordinary income over ordinary expenditur

Notwithstanding the continuance of the financia depression throughout the country in 1922, deepenin interest of the public in the voluntary hospital move ment is shown by the following figures:—

	Ordinary income.		Decrease in ordinary expenditur
England	£81,634 increase	....	£240,210
Scotland	£13,056 decrease	....	£35,372
Net increase	£68,578	....	£275,582

The remarkable reduction in ordinary expenditur in which the majority of the hospitals participated was in large measure accounted for by a fall of approxi mately 16 per cent. in the expenditure on provision 9 per cent. on surgery and dispensary, and 4 per cent on domestic expenses. On the other hand, there wa a slight increase of some 5 per cent. under the headin of salaries and wages.

Financial Heritage of Voluntary Hospitals.

A feature of the voluntary hospital system that i not always fully appreciated is the legacy towards th endowment of the hospitals that has come to th present generation from its predecessors. The 66 hospitals, with 41,043 available beds, dealt with in th present survey have invested funds to the tota amount of £17,029,424, yielding an annual interes of £795,509, or £4·67 per cent. The hospitals i Scotland appear to receive a richer flow of legacie than the English hospitals.

Hospital Annual Reports and Vital Statistics.

A marked improvement in the form of presentin the hospital statistics is found in the annual report for the past year, particularly in those of many smalle hospitals which have now adopted some modificatio of the uniform system of accounts, and publish a audited balance-sheet. Hospital statistics are of tw kinds—(1) household or domestic statistics, and (2) vit statistics—relating to the patients treated; publica tion of the first group aids the improvement of hospit administration by comparison with other hospital and the second group is useful in that the advance ment of clinical medicine and surgery is in no sma measure dependent on case records. Hospitals coul receive valuable guidance in the adoption of a unifor minimum standard of records to be kept, if such standard were to be drawn up by some recognise authority, e.g., a joint committee set up by the Roy Colleges of Physicians and Surgeons.

Investigation of the Cause and Nature of Disease.

The daily hospital practice of voluntary doctors ma be regarded as *defensive* medicine; in the work of th hospital laboratories medical science takes the *offensiv* It is still too little recognised by the public that t expanding science of preventive medicine owes i existence in large measure to work carried out i hospital laboratories. In large hospitals the labor tory accommodation has evolved during the past 2 years from a single room with one trained worke until now there is a pathological and bacteriologic institute attached to many of the hospitals and staffe ighly-trained personnel. In smaller hospitals, the ifying information is to be found in many annual rts that during the past year steps have been en to establish some form of laboratory accommo- ion ; quite a number of hospitals for the first time lish details of laboratory work, and in some ances coöperative arrangements have been arrived etween a number of neighbouring smaller hospitals, hat the services of a pathologist may be available the group. In other instances it has been suggested t applicants for the post of resident medical officers uld produce evidence of special training and ipment in pathological and bacteriological work, icient to enable them to undertake a certain dard of laboratory work.

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[1] The Voluntary Hospitals in Great Britain (excluding London): Fourth Annual Report for the Year 1922. London: 19, Berkeley-street, W. 1. 1s.

Hospital Feeding.

he feeding of a patient is a very important factor reatment, yet, speaking generally, it may be said t the subject has not hitherto received adequate ntion. In a number of hospitals visited during past two years, it was noted that the medical fs were devoting considerable attention to this stion of feeding, and had insisted on the establish- it of a special kitchen committee to raise the dard of feeding in the hospital. The monotony nstitution feeding cannot but react unfavourably n the patient ; more hospitals might adopt the of a kitchen committee, and it would be of great antage were each large hospital to have a trained itian, who would work out for the doctor a diet able to the complaint of the individual patient. s not, of course, suggested that this would be essary for all patients. Increased attention, as ve outlined, to the question of patient feeding, will bably raise the cost per bed, but any increase in cost of provisions may be counterbalanced by a ction on drugs. However, the public will never to respond to the call for additional money ired in the improvement of the feeding of hospital ients.

The Cottage Hospital.

hapter III. of the report contains some views set at length on this subject. The question arises ther the cottage hospital idea has not been rather rdone. The steady falling-off in the number of pied beds during the past three years lends colour his idea ; in England the percentage of available s occupied was 69·43, and in 1922, 59·23 ; in tland the percentages were 77·16 in 1920 and 6 in 1922.

the cottage hospitals in England and Scotland, the average, approximately 2000 beds, out of a l of 5179, remained idle throughout 1922. Two gestions are outlined whereby more use might be le of beds in rural hospitals—namely, (*a*) many hese cottage hospitals could negotiate with the e hospitals in neighbouring towns, to take in some ents in an early stage of their convalescence, and enable these overpressed town hospitals to take their waiting lists of patients ; and (*b*) many age hospitals with empty beds could render excel- service to the local communities in which they are ate, by making arrangements to receive maternity s, especially first cases, from the local villages nd. Institutional provision for such work in l areas is extremely limited ; even the supply of ied maternity nurses in country districts is very lequate. In agreeing to undertake this work, the age hospitals might render valuable assistance ducing the present high rate of maternal mortality morbidity.

ablishment of a Central Bureau of Information.

ith the object of rendering further assistance to the ntary hospitals, the Joint Council of the Order of ohn and the British Red Cross Society has estab- d a central bureau of information on hospital ters, and a large number of hospitals have readily owledged their indebtedness for the assistance ined from this source. The central bureau has been utilised for hospital information during the year by Government departments (War, India, and Colonial Offices), by several of the Voluntary Hospital Committees set up by the Voluntary Hospitals Commission, and also by the Governments of several of the Overseas Dominions.

The report contains many useful charts and tables.

A YEAR'S WORK OF THE SCOTTISH BOARD OF HEALTH.[1]

The annual report of the Scottish Board of Health now before us is a fairly complete summary of the various branches of public health and medical work carried out in Scotland at the expense of public funds ; and it may be profitably read by candidates for a diploma in public health, by public health officials and administrators, and by social workers in general. Its contents are comprised under five headings : sanitation, medical and allied services, housing and town-planning, Poor-law and public assistance, and miscellaneous ; and points calling for quotation or comment are contained in each of these sections. In a prefatory statement attention is drawn to the demand for economy and the distress among large sections of the population, which while pulling strongly in opposite directions has resulted in an unprecedented expenditure from public funds to relieve social distress. That the unfortunate character of the first of these pulls has been realised is shown by the statement that some of the health services on which the ban of economy has been especially exercised are practically new services " that were only in the course of development when the need for economy arrested them." Fortunately, prior to this fitful stage, sanitation had vastly improved.

Medical and Allied Services.

The statistics of pulmonary tuberculosis are interesting in contrast with those of England. They show a slight rise of death-rate in 1915, a practically stationary death-rate in the next three years, followed by decline ; whereas in England war excess of death-rate from this disease is shown during four years. It seems likely that the unfavourable circumstances of war-time were less operative in Scotland than in England. As in England, there is some evidence of reduction of prevalence of venereal diseases ; and the statistics as to numbers of patients receiving treatment at public clinics do not support the alarmist views of those who advocate compulsion in regard to continuance of treatment. Of the patients ceasing to be treated in the year, 45 per cent. were discharged cured, 7 per cent. were transferred to other treatment centres, and 21 per cent. left after completing a course of treatment, but before final tests as to cure had been made. It is noteworthy that of the cases of " syphilis alone " over 11 per cent. were congenital syphilis, illustrating once more the vast field only very partially explored of familial preventive medicine which might be cultivated, irrespective of any question of formal notification of disease. The statistics as to extra-genital syphilis place casually acquired syphilis of non-sexual origin in its proper place of relative unimportance, as only 0·86 per cent. of the cases treated were of this type.

We should have welcomed further particulars as to the Scottish experience of vaccination. There is much needed a comparative statement of Scottish and English experience concerning the supply of vaccine lymph ; and it appears desirable that in both countries the State provision of guaranteed calf-lymph to medical practitioners applying for it should receive serious consideration, along with the imposition of the obligation on all practitioners receiving the lymph to make an exact report of the result of each vaccination. Attention is drawn to the excessive puerperal death-rate in Scotland which there is " ground for believing . . . is one of the highest to be found among civilised countries." The subject is under consideration, and there can be little doubt that a large share of this mortality is preventable. A useful summary is given of the work of the Highland and Islands (Medical Service) Fund, provided by the Government, to supply medical services in areas in which otherwise this would be lacking. The mere physical difficulties in certain instances, even with a provided service, are almost appalling, as in a striking instance recorded in the report, in which a single visit entailed an absence of the doctor from his home during four days.

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[1] Fourth Annual Report of the Scottish Board of Health, 1922.

Milk-supply, Medical Benefit, Housing.

Attention is drawn to the valuable report issued by the Scottish Inter-departmental Committee on the laws, regulations, and procedure governing the sale of milk in Scotland. In this report the setting up of a legal minimum limit of fat content is recommended, a procedure which would cut the Gordian knot of serious administrative difficulty in the control of milk-supply. On the working of the National (Health) Insurance Act the report is optimistic, and the opinion is expressed that the work of administering the Act was carried out by societies and branches in an efficient and satisfactory manner, though note is made of the multiplicity of Acts and Regulations which have rendered this task unnecessarily difficult. No marked dissatisfaction with the working of medical benefit has been shown, and attention is drawn to the success of the district medical staff. The trend of movement of membership from friendly societies in the direction of the industrial and collecting societies is also noted—a movement of doubtful gain, if any.

The housing position continues unsatisfactory in Scotland as in England. Credit is given to the Government "cuts" in July, 1921, for the healthier condition in building costs; and the Scottish Board continue to take the larger view and insist on a reduction in costs. Nevertheless, the housing problem in Scotland is still a long way from being solved, and the shortage is stated in the report to be probably accumulating.

The section of the report dealing with Poor-law relief is necessarily its least satisfactory part. Not only is there no evidence of attempt to increase the preventive element in Poor-law administration, but no indication is visible of increasing effort to make Poor-law infirmaries more generally available and to separate them more completely from workhouses. These problems call for early attention, for which legislative as well as administrative reforms are required; but in present circumstances these important social measures will be difficult to secure. It may be hoped that the recent report of the Scottish Committee on this subject will lead to practical action.

NATIONAL ASSOCIATION FOR THE PREVENTION OF TUBERCULOSIS.

(*Concluded from p. 124.*)

FRIDAY, JULY 13TH.

Sir ARTHUR STANLEY presided over the meeting. The subject for the morning session was

Relative Prevalence of Tuberculosis among Workers in Different Trades: Methods which are Likely to Reduce the Incidence in Special Trades.

Prof. VICTOR WOROBIOF (of the University of Moscow) conveyed the greetings of the All Russian Tuberculosis Conference to this conference.

The discussion was opened by Prof. E. L. COLLIS (Mansel Talbot Professor of Preventive Medicine, University of Wales). Industry, he stated, has been accused of being in Great Britain the last stronghold of phthisis. There lies in this accusation a large element of truth, so far as adult tuberculosis is concerned. Nevertheless, the manifold influence exerted by modern industrialism upon the general health of the community, of which the prevalence of phthisis is a useful index, must be grasped before more direct influences exerted by certain occupatio can be seen in true perspective. Generally speakin the course of events appears to have been th whenever the habits and customs of a communi in which tuberculosis is endemic have been disturb the disease has increased in prevalence. The soc logical changes covered by the words "disturban of habits and customs" must be held to include foo supply in relation to the call for energy outpu aggregation of population in great centres of indust with regard to both housing conditions and places employment, transport facilities, increase in t alcoholic habit, &c. Associated with this increas prevalence the age of maximum incidence of t disease is found to move from late life to early ad life. Then as the community settles down to the n conditions phthisis falls and the age of the maxim incidence recedes again to late life. Undoubted changes in habits and customs associated with t advance of modern industrialism have exerted powerful influence upon the prevalence of phthis Three influences were at work conducing to phthis The first was the aggregation of individuals employ at sedentary work; the second the alcoholic hab and the third exposure to certain dusts containi silica. On the other hand, hard work, mental physical, outdoor life, and uncrowded indoor life no way favoured the disease. Industrial prosper resulting in better feeding, the avoidance of ov crowding, sobriety, and the suppression of dust we also potent preventives of phthisis mortality. Phthi mortality in America had fallen in a remarkable w since prohibition.

Dr. G. B. DIXON (chief tuberculosis officer Birmingham) dealt with pulmonary tuberculo amongst brass workers. An examination, he sa of the mortality returns, which refer to males engag in different occupations in England and Wales duri the years 1910–12, showed that workers in the br and bronze trade present a higher mortality rate pulmonary tuberculosis than occurs amongst m workers in many other occupations. It is a mortal rate which approximates to that of occupations whi have a recognised and ill-reputation, because of t excessive prevalence of tuberculosis amongst th employed in them. Workers in the dipping shops exposed to the inhalation of acid fumes and to t weather, and they frequently stand on wet floo Polishers work in an atmosphere containing an amou of dust, which varies according to the ventilation a cleanliness of the place in which they are employ The dust is partly metallic and partly composed o mixture of sand, and lime and textile fluff worn off t polishing discs. As a result many of them suffer fr chronic bronchitis, pulmonary tuberculosis, a fibroid changes in the lungs. Simon and Kynvett c attention to the fact that amongst 1200 brass casters Birmingham, there were not more than ten w were over 60 years of age, and in connexi with the superannuation fund of the Brass Worke Association, from which casters at the age of can derive benefit, only three men were enjoying t benefit.

The Registrar's death returns for Birmingham sh that during 1921 there were 502 deaths fr pulmonary tuberculosis amongst males of 15 ye and upwards, and of this number 46, or 9·2 per cen occurred amongst brass workers. Similarly, in t year 1922, there were 528 deaths from the same disea of which 51, or 9·6 per cent., occurred amongst br workers. These numbers were the largest for p monary tuberculosis associated with any occupati during the period, notwithstanding the fact that br work, although an important section of the cit industry, was not the one giving employment to t largest number of persons. The census return for t city in 1911 showed that there were 9879 mal exclusive of 1484 brass founders and 747 br finishers employed in the trade. Undoubtedly, si that date the numbers had undergone some chan but so also has the mortality rate for pulmon tuberculosis. In 1911 it was 1·14 per 1000, in 1

was 0·93, and in 1921 it was 0·97 per 1000 of the
otal population, and allowing for variation in the
umbers employed in the trade and for the diminution
the death-rate from pulmonary tuberculosis, it
ust be conceded that in the years 1920 and 1921 the
eath-rate from this disease was much higher for brass
orkers than it was for the total population. If the
jurious effects from this trade are to be reduced to a
inimum adequate methods for ventilation must be
tilised, and provision for the ready escape of fumes
nd dust must be forthcoming. In those processes
here dust is produced, arrangements should be made
r its removal and the prevention of its dissemination
the atmosphere. The figures relating to alcoholism
nd mortality amongst brass founders suggest the
ecessity for more temperate habits amongst this class
worker. The importance of satisfactory housing
commodation for those who work under conditions
ich as many brass workers experience is too obvious
r comment.

Mr. G. A. **Isaacs** (general secretary, National
ociety of Operative Printers and Assistants) then
ad a paper dealing with the printing trade. He
ated that it is now generally accepted that the
evalence of tuberculosis is relatively higher in the
inting trades than in any other. Some authorities,
said, believed that the presence of lead in this
dustry was an important factor in the causation of
berculosis. The Austrian Government's report
health conditions in the printing trades, published
1909, refers to the fact that lead poisoning and
berculosis go hand in hand. He blamed the
rmer low standard of living for the prevalence of the
sease among machine-room workers. An improved
andard of life had brought about improved con-
tions. Hygienic conditions in machine-rooms had
ceived attention, but they still await the introduction
a vacuum cleaner, as now so universal in American
ices. He stated that, given more information and
pert guidance, the printing industry would do its
are towards improving conditions.

Dr. J. **Doig McCrindle** (medical officer of health
d chief tuberculosis officer, Corporation of North-
npton) spoke of a considerable incidence of the disease
nong boot operatives. He complained that sanatorium
tients were not allowed to resume the work they
ew, but were taught uninteresting and unre-
nerative outdoor employments which brought in
wage that was beggarly in the delicate condition of
e patient. He suggested the setting up of work-
ops under skilled supervision, where the lighter, if
t all, processes of bootmaking could be carried out
the patients.

Dr. H. **Scurfield** (late medical officer of health for
effield) dealt with tuberculosis in connexion with
inders. He stated that 50 per cent. of the grinders
Sheffield died of pulmonary tuberculosis. When
rate is split up, it is found that it is only the male
ath-rate from pulmonary tuberculosis which is
gh compared with the English rate. The female
ath-rate from pulmonary tuberculosis is much
low the English standard. A comparison of the
es in the large towns show an extraordinary varia-
n. He stated that he had for long thought the
lustrial factor very important, and he did not think
would have been possible for publicists to give
t the quarter-truth, " Tuberculosis is a housing
oblem " if it had been generally recognised that the
most in the house had a tuberculosis mortality
ly about two-thirds of that of the other sex. He
de the suggestion that this Association confer with
Society of Medical Officers of Health, with a view
considering exactly what statistics would serve the
rpose, so that in due course a proposition may be
omitted to the Ministry of Health.

Dr. R. **Pratt** (Leicester), Mr. T. W. **McAra**
cretary of the Newspapers Proprietors Association),
Reginald Dudfield (medical officer of health
Paddington), the **Mayor** of West Ham, Dr.
imble (Belfast), and Dr. J. **Wheatley** (medical
cer of health for Shropshire) also took part in the
cussion.

Afternoon Session, July 13th.

Sir **Robert Philip** (President of the Royal College of Physicians of Edinburgh) took the chair.

Dr. G. **Lissant Cox** (central tuberculosis officer, Lancashire County Council) opened the discussion on

Notification of Tuberculosis: Proposed Amendments of Procedure.

He stated that the compulsory notification of all cases of tuberculosis has now been in force for ten years, and may be regarded as the foundation on which public health measures are based. The object of the notification of persons suffering from tuberculosis, required to be made under the Public Health (Tuberculosis) Regulations of 1912 and 1921, is to make the medical officer of health aware of the existence of a case of infectious disease in his district so that appropriate measures can be taken in regard to the prevention of the spread of infection. Considerable attention has been drawn to the unknown infective cases of tuberculosis existing amongst the community, and the number of deaths from pulmonary tuberculosis which are reported for the first and only time at death, give some indication of the importance of this aspect of the disease. Special investigations carried out in Lancashire since October, 1920, give the following important results :—

> (*a*) That so many as 43 of the 194 deaths in 1922 occurred in public institutions ; (*b*) that in 25 per cent. of the remaining 147 the doctor was only called in attendance a matter of a few days prior to death ; (*c*) that in only 7 per cent. of the 147 deaths there was apparently no reasonable excuse for non-notification ; (*d*) that while it is possible to suggest that a large proportion of persons certified as dying from tuberculosis (all forms) but not previously notified as suffering from the disease, were wrongly diagnosed by the practitioner at the time of writing out the death certificate, there does not appear from our inquiries to be any large margin of error so far as pulmonary tuberculosis is concerned, and consequently the importance of the non-notification of these cases can be seriously discounted ; (*e*) that in 47 per cent. of the 147 deaths notification was not made owing to a misunderstanding of the Tuberculosis Regulations, or to the belief that the case had already been notified.

From the above, Dr. Cox continues, it is clear that Article V. of the Public Health (Tuberculosis) Regulations, 1912, should be simplified by amending or repealing the qualification that a doctor shall not notify a case if he has reasonable grounds for believing that the case has already been notified.

Dr. **Dudfield** stated that nothing was to be gained by refusing to recognise the fact—that compulsory notification of tuberculosis had not achieved the success hoped for. Not only is notification incomplete, but too many certificates are received too late. Dr. Dudfield also proposed an amendment in Article V. of the Public Health (Tuberculosis) Regulations, 1912, viz., " if he has reasonable grounds for believing a case has already been notified . . . ." leads to omission when two or more practitioners treat a case, each looking to the other to notify. Again, when a patient whose case has been notified in one district moves to another, but remains under the care of the same practitioner, he thinks that further notification is not required. The latter reading of the proviso he considers wrong, as the proviso ends with the words (following immediately after those already quoted) " to the medical officer of health for the district within which the place of residence of the person is situate." He is of the opinion that the proviso ought to be repealed, thereby making every practitioner " attending or called in to visit " a case of tuberculosis responsible for the notification of the case and eliminating the leak which at present exists under the Article.

Dr. **Cecil Wall** (physician to London Hospital and Hospital for Consumptives, Brompton) suggested that suspects of tuberculosis should be notified, and the printed form be amended so that by a stroke of the pen the doctor may state whether he suspects, or is certain of, the diagnosis.

Prof. J. **Robertson** (medical officer of health for Birmingham) said that what he was going to say about notification had already been said by the men before him, but there were one or two points he would like to emphasise. His own experience was that if proper facilities were given to medical practitioners to enable them to make a diagnosis in difficult cases, there was not much difficulty in notification being properly carried out. He also mentioned the importance of medical students getting more responsible training in the difficult diagnosis of the early case of phthisis; up to the present time adequate training was not sufficient. He advised more observation beds in sanatoriums and the facilities of X ray, &c.

The conference concluded with votes of thanks to the City Authorities, to the Health Committee, and Prof. John Robertson for the excellent arrangements made. A lecture was given in the evening in the large lecture hall of the Birmingham Midland Institute by Sir ROBERT PHILIP, his subject being: The Actual Position of the Tuberculosis Problem To-day. Prof. John Robertson presided. On July 14th various visits to institutions and places of interest were arranged.

PARIS.

(FROM OUR OWN CORRESPONDENT.)

Medical Centre for the Service de la Navigation Aérienne.

THE medical centre for examination and study attached to the Service de la Navigation Aérienne was recently opened at the air-port of Bourget, near Paris, in the presence of Mr. L. Eynac, Under-Secretary for Aeronautics. The Service is civilian, and independent of the medical department of the Military Air Service. Its director is Dr. Paul Garsaux, who is known for his work on the influence of high altitudes on the human organism. Dr. Garsaux gave an outline of the objects of the Service, which is installed in an up-to-date pavilion named after Paul Bert, whose memory is associated with work on atmospheric pressures. The ground floor of the building contains administrative offices, an aid-post, two operating theatres prepared for emergency action, a dispensary, a bacteriological laboratory, a physiological laboratory, and several rooms for examination of pilots. The tests in use will be those laid down according to Annexe E of the Peace Treaty, which deals with the regulation of air navigation. The chief interest of the establishment, however, is the basement, which contains an air-tight compartment, measuring 5 by 3 metres. By means of a turbine engine the air of this compartment can be depleted in order to reproduce the atmospheric condition at any given altitude, and a refrigerating plant is attached which reduces the temperature in proportion to the atmospheric pressure obtained. The whole apparatus is electrically worked, with a system of illuminated safety signals. This unique establishment should enable much useful research work to be carried out.

International Congress for Social Hygiene Propaganda.

An International Congress dealing with social hygiene propaganda and with prophylactic, sanitary, and moral education, was held in Paris at the end of May. The congress was divided into five sections, among the presidents of sections being Profs. Léon Bernard, E. Jeanselme, and Pinard. The general subjects were as follows: (1) The rôle of public institutions for social hygiene; (2) the possibility of the establishment of a schedule of venereal diseases; (3) prophylaxis against venereal diseases in marriage and in the family; (4) sexual education at puberty and in general; (5) Red Cross work. Conspicuous among the communications made to the first section was one by Dr. M. Laignel-Lavastine on prophylactic education against poisons, alimentary (coffee, alcohol, &c.) and non-alimentary (opium, cocaine, &c.). Resolutions were passed by the fourth section to the effect that instruction with regard to the sexual instinct, and the high duties and dangers connected with it, should be given in all primary schools, and to all children of both sexes, according to their ages; that until the onset of puberty instruction should be confined to facts relating to lower animals and to vegetable life; that moral instruction should include consideration of chastity and continence, and of the duty of adults to have children under the best possible social conditions; and that girls should be taught the significance of the secondary sexual characteristics at the time of the appearance of the latter.

Deaths of Drs. O. Josué and J. P. Langlois.

Dr. O Josué, physician to the Hôpital de la Pitié, and vice-president of the Société de Biologie, died suddenly whilst at work in the hospital. He published several works dealing with adrenalinæmia, in which he described the action of adrenalin in the formation of atheromatous lesions, and in the production of aneurysms, and later specialised in the study of cardiac affections.

Dr. J. P. Langlois, professeur agrégé of the Faculté de Médecine de Paris, was professor of hygiene at the Conservatoire des Arts et Métiers, a member of the Académie de Médecine, and one of the leading physiologists of the day. Born in 1862, he became a pupil of Charles Richet, and under his direction, in a thesis for the degree of doctor of medicine, described new research work with the colorimeter, with particular reference to caloric radiation at various times of day. He emphasised the importance of, and in 1887 undertook the study of, the rôles of acute and chronic diseases in the production of heat. In recent years American research work in relation to basal metabolism has confirmed his results, first published in 1896. After study relating to the suprarenal capsules, Langlois carried out research into chlorine equilibrium, holding that the blood maintained this equilibrium even after a hæmorrhage, or after a prolonged chlorine-deficient diet drawing on the chlorine supply of other tissues, notably the muscles. At the same time he worked at the application of physiology to industrial hygiene, particularly in relation to work in warm and humid conditions, and to the physiological effects of nitrous vapour. His long record of valuable service led to his election to the newly constituted chair of physiology applied to physical education.

The Services.

ROYAL NAVAL MEDICAL SERVICE: NEW DIRECTOR-GENERAL.

Surg. Rear-Admiral Joseph Chambers, C.B., C.M.G., has been appointed Director-General of the Medical Department of the Navy in succession to Surg. Vice-Admiral Sir Robert Hill, K.C.B., K.C.M.G., C.V.O., K.H.S., with effect from Oct. 1st next.

ROYAL ARMY MEDICAL CORPS.

Capt. A. F. C. Martyn is restd. to the estabt.

Temp. Capt. W. M. M. Jackson relinquishes the temp. rank of Maj.

Temp. Capt. W. M. M. Jackson relinquishes his commn. and is granted the rank of Maj.

The undermentioned temp. Capts. relinquish their commns., and retain the rank of Capt.: G. B. Proctor and A. R. Leach.

TERRITORIAL ARMY.

Capt. Q. V. B. Wallace, R.A.M.C., to be Divl. Adjt., 42nd (E. Lancs.) Div. and School of Instruction, vice Maj. W. H. O'Riordan, R.A.M.C., vacated.

Capts. J. M. Smellie (late R.A.M.C., Spec. Res.), A. C. Haddow (late R.A.M.C., T.F.), and R. Cunningham (late R.A.M.C., Mila) to be Capts.

Capt. H. Jacques relinquishes his commn. and retains the rank of Capt.

W. Simpson to be Lt.

Second Lt. W. H. A. Dodd (late R.A.F.) to be Lt.

TERRITORIAL ARMY RESERVE.

Cols. de B. Birch, J. Turton, E. Lee, H. J. Mackay, and J. R. I. Raywood having attained the age limit are retired and retain their rank with permission to wear the prescribed uniform.

Cols. C. E. Harrison and E. C. Freeman having attained the age limit are retired and retain their rank.

Public Health Services.

EPORTS OF MEDICAL OFFICERS OF HEALTH.

THE following table gives some of the principal ealth statistics of a group of cities, towns, and urban istricts for 1922 :—

Name of town.	Estimated (R.-G.) mid-year population.	Birth-rate.	Death-rates per 1000 of the population.				Death-rates per 1000 births.		
			All causes.	Tuberculosis.	Cancer.	Respiratory with influenza.	Infant mortality		Maternal mort. in childbirth.
							Legit.	Illegit.	
arlisle C. ..	53,490	23·6	14·6	1·2	1·2	3·6	77	147	2·4
orcester C. ..	49,240	19·8	13·5	1·2	1·2	3·2	64	143	2·0
inchester C. ..	23,750	19·2	11·5	0·5	1·4	1·9	37	48	4·4
orthampton C.B.	92,950	17·7	11·3	1·1	1·2	2·4	51	80	1·8
orquay B. ..	33,690	14·5	17·5	1·8	1·8	3·2	38	121	6·1
eston and Isleworth U.D. ..	46,330	18·7	11·8	1·0	1·0	2·1	70	226	4·4
endon U.D. ..	55,930	17·4	8·8	0·6	1·2	1·7	42	98	2·0
ford U.D. ..	86,370	17·8	9·5	0·6	1·0	1·7	52	135	4·0
penborough U.D.	31,670	16·3	12·6	0·8	1·3	2·6	90	266	12·0
winton and endlebury U.D.	31,780	19·0	11·0	0·8	1·1	3·2	74	143	5·0
ottenham U.D.	150,500	21·0	11·3	1·0	1·1	2·6	—	—	1·6
Villesden U.D. .	168,900	18·7	10·6	0·9	1·0	2·3	54	245	3·2

C.=City. C.B.=County borough. B.=Borough.
U.D.=Urban district.

Carlisle.

Dr. Joseph Beard reports that Carlisle, like many ther towns, suffered from an influenza epidemic during he first quarter and that 55 deaths of residents were egistered from this cause. The maternity hospital dmitted 183 cases as against 144 in 1921. The umber of women resorting to artificial feeding during he time of the midwife's attendance is less, but r. Beard thinks artificial feeding is much too frequent, onsidering the small number of married women ndustrially employed. One-third of the 180 new xpectant mothers attending the ante-natal clinic had efinite abnormalities needing attention. The number f stillbirths notified was 66, equal to 5 per cent. of he live births. There were 6 infantile deaths due to ccident, and in 4 of these accidental smothering was he cause given. Definite action is being taken to ompel owners to carry out war arrears of repairs.

Worcester.

Dr. Mabyn Read reports that housing shortage is till urgent. The overcrowding is often bad, but to ake action would have been in most cases a cruel ct. Dr. Read is afraid that in the years to come there vill be an increase of tuberculosis, owing to lessened esistance, caused by overcrowding, want of sunlight n the homes, insufficient food, and anxiety due to nemployment. The "appeal to the cow" was tilised in most of the successful milk prosecutions. Dr. Read regrets the reluctance of women to seek reatment at the V.D. clinic for gonorrhœa. The need or a maternity home is felt. Half the infant deaths ccur in the first month, showing the need for antenatal work. From 13 to 14 expectant mothers in the ast three months of pregnancy and nursing mothers were provided with dinners daily at a cost of 1*s.* 3*d.* and subsequently 1*s.* per dinner, with good effect. Dr. Marion Andrews comments favourably on the fact that midwives sent for a doctor in about 20 per cent. of their cases.

Winchester.

Dr. W. A. Bruce Young reports that the rapid completion of a large number of houses at Stanmore is having an appreciable effect on overcrowding, which is, however, still considerable. The large amount of unemployment has called for a corresponding supply of extra milk for mothers and babies and will probably call for still more next winter. The outstanding needs of the schools are: (1) A school dental service; (2) medical inspection for secondary schools; (3) playground classes or an open-air school; (4) a special school for backward children and higher-grade mental defectives.

Northampton.

Dr. J. Doig McCrindle pays a tribute to the foresight of the water engineer in saving the town from a water shortage; a temporary supply from the river was chlorinated and rendered safe. The use of this supply was discontinued in August, 1922. Although the corporation have been active in providing new houses, 224 municipal houses having been completed during 1922, the result was not much in evidence in the relief of overcrowding. Action with regard to an unhealthy area, comprising 67 houses with a population of 314, reported by Dr. McCrindle, has been postponed. Most of the milk prosecutions were dismissed, and Dr. McCrindle thinks that the "Hunt *v.* Richardson" case and the "absurd" circular letter of the Ministry of Health of July 17th, 1922, have rendered futile attempts to deal with milk found not to be genuine. Elementary, private, and Sunday schools were closed for a time at the end of January owing to the influenza epidemic. The ante-natal work has progressed, and Dr. McCrindle can point to a decline in neo-natal mortality as compared with the previous decade.

Torquay.

Dr. Thomas Dunlop points out with reference to the high death-rate from cancer that the population includes a large number of old people. The general death-rate of 17·5 becomes 15·3 when corrected for age and sex. There is no maternity home and antenatal work is hardly begun. Dr. Dunlop regrets that the proposal to have a V.D. centre fell through on financial grounds. The building of bungalows in areas which cannot be sewered owing to the levels is commented on. A local Bill now before Parliament includes provisions likely to prove useful—e.g., powers to establish a public abattoir, to prevent an advanced consumptive from handling food, to require persons dealing in shell-fish to furnish the source of supply, &c. A committee has been formed to create a demand for Grade A milk, and deputations have been to Reading to study methods. Owing to housing shortage, an insanitary area cannot be dealt with, and it is difficult to get repairs carried out.

Heston and Isleworth.

Dr. Elwin H. T. Nash reports that there are 41 private wells in his district, from which water is used for domestic purposes. During the year 117 taps from the main, in lieu of taps from inaccessible and uncovered cisterns, were provided in compliance with notices. An interesting account is given of the outbreak of lead poisoning associated with beer containers lined with a lead-containing enamel. Dr. Nash and all those concerned, including the brewery company, are to be congratulated on the prompt manner in which the matter was dealt with and the containers removed. During the autumn the hospital was overtaxed and the Milne treatment was adopted with success for home-treated cases of scarlet fever. A midwife was reported for delay in complying with the regulations in a case of ophthalmia neonatorum. The child in question is completely blind and Dr. Nash is amazed that the Central Midwives Board have merely placed the midwife on three and six months' probationary service. Ante-natal work is negligible and baby-welfare work difficult owing to unsuitability of premises, and there is no dental clinic for mothers and little children. Housing conditions remain unsatisfactory and overcrowding cannot be dealt with. Dr.

Nash is strongly opposed to wholesale removal of enlarged tonsils, as he finds that a considerable number disappear after a septic mouth has been cleaned up. He also advocates complete enucleation and does not believe in the removal of a mere slice. There is need for an open-air school.

Hendon.

Dr. T. S. McIntosh points out one disadvantage of the substitution of gas-fires for coal—viz., the increase in house refuse. The Hendon Council have decided to build a new hospital in lieu of the temporary one which has been in use for 30 years. Dr. McIntosh reports that there is some difficulty in getting defects of the teeth and vision treated in the schools.

Ilford.

Dr. A. H. G. Burton submits a very complete report on the health administration and school medical service of Ilford. The percentage of children found by the school nurses with verminous heads has been reduced from 10 per cent. in 1920 to 5 per cent. in 1922. The work of Mr. R. S. Charsley, the school oculist, is being more appreciated, and he succeeded in treating 90 per cent. of the discovered cases of defective vision. The school dentist is faced by a formidable task, as 62 per cent. of the children examined by him needed treatment, and, although less than half of these were brought by the parents for treatment, the number actually treated exceeded 2000. Satisfactory arrangements have now been made with neighbouring districts for the accommodation of small-pox patients at the Orsett Joint Hospital in the first instance, with the West Ham Council's hospital at Dagenham in reserve.

Spenborough.

The chief event recorded by Dr. Lawrence Pick is the opening of the new health offices with a school clinic and maternity and child welfare centre. Dr. Pick, however, expresses his regret at the continued refusal of the Board of Education to sanction a dental service or the treatment of ringworm by X rays. Of 1076 routine-inspected children 50 were noted as being poorly nourished, a larger percentage than in 1920.

Swinton and Pendlebury.

Dr. H. C. Mulholland points to the need of hospital treatment for measles, pneumonia, and infantile diseases which cannot be nursed in an overcrowded home. He thinks there is an increased interest in public health matters and hopes this may lead to a demand for cleaner milk, cleaner handling of food, and the abolition of the smoke nuisance. The attendances at the antenatal clinic, conducted by Dr. C. G. Magee, continue to increase, and the results of the work are said to be very encouraging. As an illustration of the need for more houses, it is mentioned that of 561 newly-born infants visited 16 per cent. were born in a house already overcrowded, and 40 per cent. were born in a house occupied by two or more families.

Tottenham.

Dr. David C. Kirkhope reports that the houses completed by his council and the London County Council have not alleviated the housing difficulty to any appreciable extent. The culverting of the brook on the Tewkesbury estate is in progress and is the first really effective step towards making the adjacent properties sanitary. Dr. Kirkhope condemns Circular 325 of the Ministry with regard to milk prosecutions, which had not been withdrawn when his report was issued in March, 1923. Dr. Kirkhope also regrets that the scheme for coördinating the work of all the health nurses employed by the Tottenham Council gives no appearance of coming to fruition. The work of the school medical service continues to grow. The sessions at the minor ailments clinic have had to be increased. A second dentist began work in May. A satisfactory arrangement has been made with the National Hospital for Diseases of the Heart for examination of special cases of heart disease. The large number of children suffering from chronic otorrhœa and in attendance at the minor ailments clinic is disquieting, and a "sure, safe, and simpl remedy for the malady is urgently needed."

Willesden.

Dr. George F. Buchan shows the effect of the imposition of the 2*s.* 6*d.* registration fee for attendance at th municipal clinics. The attendances of mothers an "under 5" children fell by 42 per cent. for the firs quarter and by 34 per cent. for the full year. Ther was a similar decline in the attendance of school children which mostly, at any rate, disappeared o the withdrawal of the registration fee for school children on July 10th, 1922. Dr. Buchan has to recor considerable damage from ophthalmia neonatorum. O 38 cases, 31 made a complete recovery and two wer under treatment at the end of the year. Of the remaining five, three had one eye and two both eyes permanently injured. In the schools treatment was secure for 96·8 per cent. of medical defects and 59·1 per cent of dental defects. Dr. Buchan again reports that th accommodation at the schools for physically defectiv children is far from ideal and that, until the ambulan service is improved, full use of the accommodatio provided for both physical and mental defective cannot be made. Housing conditions are unsatisfactory and repairs are not carried out in the workmanlike manner of pre-war days. The manner of feedin the school-children of the South Kilburn area i reported on adversely. The table appointments ar still one spoon and the dietary lacks variety. Th earlier arrivals scramble through to make room fo others, destroying all possibility of order.

Dr. W. J. J. Stewart, the superintendent of th municipal hospital, points out that although scarlet fever is of a mild type, complications show no marked tendency to diminish. Diphtheria, he says, has become more fatal in recent years. Dr. Stewart regrets greatly that the orthopædic clinic for children o pre-school and school age, which has done much good work, will have to be abandoned as the hospital is no longer open to such cases, and the benefit done by this specialised treatment during the last three years will, to a great extent, be undone. A smaller number of maternity cases was admitted, 305 as compared with 407 in 1921. There was no case of a septic nature, no patient contracted an infectious disease, and the only maternal death was that of a woman suffering from advanced tuberculosis. Of the 286 infants born, 8 died from prematurity and 17 were stillborn. Dr. Stewart reports a great increase in the sickness rate of the domestic staff since the arrangement was adopted by which the domestic staff may live outside the hospital.

Obituary.

WILLIAM FORD ROBERTSON, M.D., C.M. EDIN.,

PATHOLOGIST TO THE SCOTTISH ASYLUMS.

Dr. William Ford Robertson, who died on July 17th at the age of 56, was a native of Roxburghshire and received his early education at Daniel Stewart's College and at George Watson's College, Edinburgh. He afterwards joined Edinburgh University, where he graduated M.B., C.M. in 1891, and proceeded to the M.D. degree four years later. He was resident physician to the Royal Infirmary and to the Royal Hospital for Sick Children, Edinburgh, as well as pathologist to the Royal Edinburgh Asylum from 1893 to 1897, when he became pathologist to the Scottish Asylums, a position which he held till the time of his death. The application of modern pathology to mental conditions was a subject which greatly attracted him, and in 1900 he published the result of his studies in a "Text-book of Pathology in Relation to Mental Diseases," which proved an interesting addition to the library of those engaged in similar work, though in some respects, owing to a desire to put forward constructional views as early as possible, it was lacking in completeness. It was not till 21 years later that he published his well-known ok on Therapeutic Immunisation in Asylum and neral Practice, a work which advanced views in ny directions controversial, but which at the same ne gave much food for thought. He was ever stressed at the difficulty of preventing mental sease in our present state of knowledge, and his ok is a valiant attempt to solve this problem. It vers ground which has still to be tested, and, leed, Dr. Robertson admitted that "numerous facts w to science are recorded and many heterodox inions are expressed which are not likely to be cepted without a fight." It was Dr. Ford Robertson no translated Tanzi's "Text-book of Mental seases," one of the best presentations of the science of ychiatry of its date (1909). He will be remembered one of those who strove constantly to correlate ental and physical disease and who succeeded at y rate in stimulating others to further research these lines.

Correspondence.

"Audi alteram partem."

LYMPHOCYTOSIS FROM INFECTIONS.

To the Editor of THE LANCET.

SIR,—Dr. Gordon Ward thinks that we have dis-issed too unceremoniously the evidence that sepsis ay produce an absolute lymphocytosis. Dr. Ward entions a case of Cabot's. This is a case which is most invariably referred to when this question is alt with in text-books or elsewhere. May I ask r. Ward to read again Cabot's original article? ne account is very brief, about 20 lines, and is parently a statement from memory of the clinical ndition and blood changes in a patient seen 15 years eviously. I do not think that it is of any great lue as evidence. In the various articles on lympho-tosis in sepsis and infections, the cases which nnot be recognised either as leukæmia or glandular ver are of similar type—that is, they are cases so sufficiently reported that no opinion can be expressed on them. It is noteworthy that the great war, so r as I know, failed to produce a single reported stance in any country in which absolute lympho-tosis can be justly ascribed to sepsis. A blood unt of 20,000 white cells per c.mm. with 60 per cent. lymphocytes would be accepted by all as a definite mphocytosis. In leukæmia these are every day gures, and many instances could be found in whoop-g-cough and in cases recognisable as glandular fever infective mononucleosis. Can medical literature roduce six definite cases where such figures have curred in conditions usually regarded as sepsis? ne would be justified in rejecting as insufficient ich examples as a streptococcus isolated from the uces in a condition otherwise typical of leukæmia, nd also many of the slighter grades of lympho-tosis. I have not found such cases in the litera-ure, and I have not met them in my own experience. was on these grounds therefore that we made the atement that there is no evidence that sepsis is a ause of absolute lymphocytosis. The production of ich cases would obviously alter the position, and it possible that Dr. Ward may be able to supply nem from the great collection of the literature of æmatology which I know that he possesses.

I am, Sir, yours faithfully,
H. LETHEBY TIDY.

Devonshire-place, W., July 21st, 1923.

SCHISTOSOMUM MANSONI IN SOUTH AFRICA.

To the Editor of THE LANCET.

SIR,—Natives working on the mines along the reef re occasionally found to be harbouring *Schistosomum ansoni*; but these are generally believed to have cquired the condition in Portuguese East Africa, and o instance is on record where the disease has been contracted in the Transvaal. In 1920 Dr. E. C. Faust reported the presence of this parasite in some fresh-water snails I had sent him from Natal, and the observation was confirmed by Dr. Annie Porter.

In June, 1921, I was apparently successful in eradicating this parasite from a coloured boy of 13, who had acquired the infection through swimming in the brickfields outside Durban in 1920. The usual signs of degeneration were observed in both lateral and terminal-spined ova obtained from the urine during a course of intramuscular injections of *emetine*.

This would appear to be the first case where *S. mansoni* has been recorded in a patient who has never left South Africa, and the infection was a slight one, giving rise to no symptoms other than those generally associated with early infestation with *S. hæmatobium* although the lateral-spined ovum was obtained both from the urine and a rectal wash.

Although well known at Kingwilliamstown in the Cape, it was thought that bilharzia disease did not occur in Natal rivers south of Durban, and that the Amanzimtoti river, which is, perhaps, the most popular place for Durban picnic parties, was certainly free from infection. However, I have collected examples of *Physopsis africana, Limnæa natalensis, and Isidora forskali* from this river, and have treated patients who have become infected with *S. hæmatobium* through bathing in several rivers along the south coast of Natal.

On June 15th, 1923, I commenced to treat a native, aged 15, who had suffered from constant hæmaturia since bathing in the Umtalumi river near Umzinto. During the last two years he has lived at a mission station near the source of the Amanzimtoti river. I have already drawn attention to the undesirability of allowing bilharzia carriers to attend schools along the course of rivers infested with the intermediary hosts of the bilharzias. Microscopic examination of the centrifugalised urine of this native showed numerous spine-pointed ova and a few lateral-spined ones. These rapidly disappeared, after showing the usual degenerative changes, under intravenous injections of *tartar emetic*, the potassium salt being used throughout. No ova were seen in a rectal wash on June 26th; but, by that time, the ova had almost entirely disappeared from the urine. In this healthy-looking native the only symptom noted was the chronic hæmaturia, which was apparently due to the escape of the numerous spine-pointed ova.

Both *S. hæmatobium* and *S. mansoni* infestation can be acquired at the Natal coast. It is impossible to say whether the latter has been introduced into the Union as a result of untreated cases returning from Egypt; but, as the introduction of a new disease is often associated with severe symptoms, these slight manifestations of *S. mansoni* infestation in young persons suggests that they are sporadic cases alone.

Nevertheless, the presence of intermediary hosts of this parasite in all the Natal rivers indicates the importance of diagnosing and treating this condition before it is allowed to spread further in the Union.

I am, Sir, yours faithfully,
F. G. CAWSTON, M.D. Camb.

Durban, Natal, June 30th, 1923.

LANCASHIRE INSURANCE COMMITTEE AND THE SPAHLINGER TREATMENT.—On July 18th a deputation from the Lancashire Insurance Committee went to the Health Ministry to ask permission to make a grant of £100,000 towards financing M. Spahlinger's Institute at Geneva, so that the Spahlinger serum may be available for insured persons in the county. On a previous occasion a similar proposition to the Ministry led to no definite result. The deputation proposed to make use of the power given to insurance committees under Section 21 of the Act of 1911, to spend such funds through some approved charitable institution. The intention is to set up such an institution at Eastbourne, to which the Spahlinger products would be sent from Geneva for the treatment of patients from Lancashire. Dr. Thomas Watts, M.P., who accompanied the deputation, called attention to the high percentage of cases treated with these remedies which had derived permanent benefit. The deputation was asked to provide further proof that the proposed Eastbourne institution will be a "charitable institution" in a legal sense, and the furnishing of such evidence is now under consideration.

INSULIN.[1]

By J. J. R. MACLEOD, F.R.S., M.B., Ch.B. Aberd.,
PROFESSOR OF PHYSIOLOGY IN THE UNIVERSITY OF TORONTO.

[Prof. Macleod gave an historical survey of the mass of work published on the relationship between the pancreas and disturbances in carbohydrate metabolism, from that of Brunner in the seventeenth century up to the time when convincing evidence that an antidiabetic hormone does actually exist in the pancreas was furnished by Banting and Best, their experiments being of a different type from those of their predecessors. He continued :—]

It now became apparent that attempts should be made to see whether the crude alcoholic extracts of ox pancreas could be sufficiently freed from those substances which made them unsuitable for subcutaneous administration to diabetic patients, either because of local irritation or general toxic effects. At this stage of the investigation we were joined by J. B. Collip, who, in a remarkably short period of time, succeeded in isolating from the alcoholic extracts, by fractional precipitation with alcohol, a precipitate which contained the antidiabetic hormone in high concentration, and which, in watery solution, could be injected subcutaneously in man without any deleterious effects. At the same time it was also discovered that the blood-sugar is lowered in normal rabbits by subcutaneous injection of extracts containing the antidiabetic hormone, and to this observation was due in large part the rapid progress which it was possible to make in the isolation of insulin. It offered a ready means for testing the relative potency of the various precipitates and filtrates, and of determining the most favourable conditions under which extraction of the gland should be carried out.

Provided with a comparatively simple method for the preparation of insulin, it now became possible to undertake a systematic investigation of its physiological and chemical properties and its possible therapeutic value, and I shall endeavour to describe briefly what has been found, and to indicate, in a general way, what appear to be the most hopeful lines for further research. It seemed advisable at this stage to group the problems demanding immediate investigation, and this was done as follows: 1. The effect of insulin on the respiratory exchange, the distribution of glycogen, and the metabolism of fat in animals rendered diabetic by pancreatectomy. 2. Its therapeutic effect in diabetes mellitus. 3. Its effect on the blood-sugar of normal animals and the symptoms which result from overdosage. 4. Its pharmacological assay. 5. Its effect on the blood-sugar in the various forms of experimental hyperglycæmia. 6. The physiological mechanism by which it lowers the blood-sugar. 7. Its source. 8. Its chemical reactions and its preparation on a large scale. In planning for the investigations of these problems we were in the fortunate position of having the whole-hearted collaboration of several trained workers, not only in my own department (E. C. Noble, J. Hepburn, and J. K. Latchford), but also in that of internal medicine under the direction of Prof. Duncan Graham (W. R. Campbell and A. A. Fletcher).

The Effect of Insulin on the Metabolism of Carbohydrates and Fats in Experimental Pancreatic Diabetes.

From the time carbohydrates are absorbed, mainly as glucose, into the blood of the portal circulation until they are completely oxidised, changes in chemical structure are constantly occurring. These consist, partly, in a condensation of several glucose molecules to form glycogen, and partly in a splitting of the molecule, proceeding through various intermediate stages. The intermediary substances formed at each stage are doubtless in a certain state of equilibrium, one with another. Many of them do not accumulate sufficiently to be detectable by chemical means, being changed into the next stage almost as quickly as they are produced, and at the present time we are limited in our attempts to follow the various steps in the process, to observations on the concentration of glucose in the blood, the amount of glycogen deposited in the tissues, and the type of combustion occurring in the organism as a whole. In diabetes marked and significant alterations occur in each of these; the blood-sugar rises to a high level, glycogen practically disappears from the liver and becomes decreased in the muscles—except the heart, in which it increases—and the nature of the combustion process, as revealed by the behaviour of the respiratory quotient, becomes changed so as to indicate that no carbohydrate is being oxidised. It is safe to assume that the increase in blood-sugar is secondary to the other changes, but it is difficult in the present state of knowledge to understand the relationship. It has been a favourite hypothesis that the primary fault in diabetes is in the oxidation of glucose, or in the chemical changes which precede this, and that this leads to the drafting to the tissues from the glycogen reserves of a plethora of sugar; a sort of forced-feeding process, as it were. Another hypothesis is that the glucose molecule must become altered in some way before it can be either oxidised or condensed into glycogen, and that this alteration does not occur in diabetes. Through the work of Irvine and his school much light has been thrown in recent years on the structure of the sugar molecule, and it has been shown that besides the well-known α and β varieties of glucose, in which the oxygen linkage is between the first and fourth carbon atoms, there is also a third variety, called γ glucose, in which the oxygen ring is displaced from the normal stable position. The detection of the γ sugars depends mainly on a comparison of the reducing and polarising powers of the solutions, and, by using this method, Winter and Smith have recently published results which they interpret as showing that the alteration in the glucose molecule alluded to above is the production of γ glucose. γ glucose, according to this view, is a necessary preliminary stage in the oxidation of glucose, and, if we suppose that it is also so for its condensation into glycogen, the inter-relationship of the three changes found in diabetes becomes immediately intelligible.

I have dwelt on these theoretical considerations because of their great interest in connexion with the mechanism of the action of insulin. For it is a significant fact that this hormone, when administered to depancreated animals, completely restores to normal each of the three functions. We have repeatedly found, for example, when it is given along with carbohydrate to depancreated dogs, that very large quantities of glycogen become deposited in the liver and that the respiratory quotient becomes raised in the same manner as it does in normal animals with carbohydrate alone. We know also from the work of Banting and Best on depancreated dogs that it reduces the blood-sugar to the physiological level, that the glycosuria disappears, and that the well-being of the animal becomes normal in every regard.

We must conclude, therefore, that insulin is necessary for the metabolism of carbohydrate, and we may suppose that its function is in some way related to the preparation of the glucose molecule for combustion and condensation. But as to whether this preparation consists in a change of α, β glucose into the γ variety cannot as yet be considered as settled. Dr. G. S. Eadie has repeated Winter and Smith's observations, and by strictly following their instructions has obtained similar results. Briefly stated, these results are that after removal of the proteins by phosphotungstic acid and alcohol from normal blood, the dextrorotary power of the filtrate is lower than it should be as calculated from the reducing power, and on standing 24 hours the differences become less, and later they practically disappear. On the other hand when blood from diabetic patients or hyperglycæmi animals is used, the dextrorotary and reducing value respond from the start, or the former may exceed latter. Administration of insulin causes the betic blood to behave in these regards like normal. The question is with regard to the interpretation of results, and, as Hewlett has pointed out, this need necessarily be that γ glucose is present, but rather t chemical changes have occurred in the very aplicated procedure which is involved in the paration of the solutions for the polariscope. ers have believed that the blood may contain, ides glucose, other carbohydrates or related stances having a relatively low dextrorotary ver. Since this question is not yet settled I need dwell on the further claim of Winter and Smith t insulin is capable of causing γ glucose to be med when added to a solution of ordinary glucose ng with an extract of liver. I may state, however, t we have so far been unable to confirm this result. The action of insulin on the metabolism of fat in betic animals is equally as striking as it is on that of bohydrates, and here again its effects are revealed chemical changes occurring at both ends as it were the metabolic chain. In a few days after pancreatomy in the dog, the blood and the liver contain essive quantities of fat, although the extreme grees of lipæmia sometimes encountered in diabetic ients have not been observed. There is also a tain degree of acetonuria, although again this is ch less pronounced than it is in diabetes in man. idently the migration of fat in the body is abnormal, l its final oxidation seriously interfered with. en insulin is given along with carbohydrates to se animals, the acetonuria very promptly dispears, the blood fat, apparently more slowly, urns to normal, and the liver in a few days contains more fat than that of a normal, similarly fed mal. As the glycogen increases in this viscus the correspondingly declines. We cannot state at ich stage in the metabolism of fats insulin exercises corrective influence, but wherever this may be, ere can be little doubt that it acts indirectly because its effect on carbohydrates. It has been said that burns in the fire of carbohydrates, and although s generalisation may, in some respects, be misleading is, nevertheless, a useful one to guide us in interting the results with insulin.

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[1] A lecture (abridged) delivered before the Eleventh International Congress of Physiology at Edinburgh on July 24th.

The Therapeutic Effects of Insulin in Diabetic Mellitus.

As would be expected, the effects of insulin on tients suffering from diabetes mellitus, in so far as se have been studied, are of the same general ture as those observed on diabetic (depancreated) gs. Until the laboratory investigations had furhed perfectly definite results no serious attempts re made to carry the investigations into the clinic, r would it have been permissible to do so in view the failures of previous workers to provide an tract that did not cause toxic symptoms. Without imal experimentation we would be no further to-day the treatment of diabetes, and in the undoubted ving of human life which has been the result, than were a little over a year ago when the treatment s first applied on any considerable scale.

In studying the results obtained by administration insulin on patients, we must bear in mind, however, at two factors may come into play that are not volved in the experiments on completely depaneated animals. One of these is dependent on the t that there probably still remains in the majority diabetic patients a certain remnant of pancreatic sue capable of secreting insulin ; and the other, on tain differences between laboratory animals and an, related in part to peculiarities in the type of tabolism and in part to the greater development of e nervous system, and to which the frequent currence of coma as a serious symptom of the nical form of the disease is due. Moreover, we ist remember that subjective phenomena can be idied only on man.

The first case in which a complete study of the erapeutic value of insulin was made was that of a boy of 14 years of age, exhibiting all the classical symptoms of the disease, and on whom treatment by dietetic control had resulted in no improvement. Daily injections of insulin between Jan. 23rd and Feb. 4th, 1922, reduced the blood-sugar even to the normal level, greatly diminished the glycosuria, and often caused it to disappear, removed entirely the ketonuria for a period of some days, and, perhaps most striking of all, "the boy became brighter, more active, looked better, and said he felt stronger." There could be no doubt as to the great therapeutic value of the treatment, when judged both by the improvement in the objective and subjective symptoms of the disease. This, along with other cases treated by insulin, and reported by Banting, Best, Collip, Campbell, and Fletcher, is only the first of a large number, exhibiting the disease in all its forms, that have been most carefully studied in numerous clinics both in Canada and the United States and in this country, and I cannot refrain from expressing my admiration for the excellent spirit of collaboration which has made this possible. I am not qualified, nor even if I were would it be in place for me here to discuss further the clinical results, but I may say that there can be no doubt that insulin is capable, when wisely used under controlled conditions, of saving many cases of diabetes which would otherwise inevitably have succumbed to coma, or to one of the many other complications of the disease. It is also certain that, as an adjunct to dietetic control, treatment with insulin greatly improves the nutritive condition and increases the resistance towards infections, thereby prolonging the expectation of life. The subjective condition and the sense of well-being of the patients are also vastly improved. As to whether continued treatment with insulin will enable the diabetic patient to recover any of his lost power of producing this internal secretion in his own pancreas, nothing definite can be said at present. It is at least significant in this connexion that the islet tissue develops considerable powers of regeneration after much of it has been destroyed as a result of ligation of the secreting ducts of the pancreas, as has been shown by R. R. Bensley to be the case, at least in the rabbit and guinea-pig. Arising as it does in these cases from outgrowths of the duct epithelium, may it not be possible in man, in whom the pancreas has not been completely destroyed by disease, that new islet tissue will become regenerated when, by administration of insulin, the strain to produce this hormone endogenously is removed ?

Returning now to the more purely physiological aspects of the subject, let me briefly lay before you what is known regarding the effects of insulin on normal animals. In the consideration of these results we must bear in mind that the conditions in the normal animal are fundamentally different from those obtaining in the diabetic. In the normal animal there is probably available at all times a sufficient amount of insulin for every purpose for which it is required, so that the addition of more from without upsets the metabolic balance and thereby induces an abnormal state. In the diabetic, on the other hand, the injection of insulin only restores to the body a hitherto missing part of the metabolic machinery and enables it to run smoothly again.

The Effect of Insulin on the Blood-sugar of Normal Animals.

Within a few minutes of the intravenous or subcutaneous injection of a moderate dose of insulin, the percentage of sugar in the blood begins to fall, and it continues to do so more or less in a straight line for a period which varies from about one half-hour to several hours, according to the animal, after which the curve may gradually become less steep or it may begin to rise again.

The prompt onset and the steep nature of the fall in blood-sugar are characteristic features of the action of insulin, and are quite unlike the hypoglycæmic effects that may be produced by administration of other substances, such as phosphorus or the insulin-like materials that have been prepared by Collip and others from clams and from various vegetable sources. Indeed, the character of initial fall is such as to give the impression that the process responsible for it must be one operating within the blood itself—an intravascular glycolysis. But this cannot be the case, since we have been unable to find that the addition of insulin to defibrinated blood kept under sterile conditions at body temperature outside the body has any influence on the rate at which sugar disappears; neither is there any difference in this regard between the blood of normal animals and that of animals injected with insulin at varying periods preceding the withdrawal of the blood. Evidently, therefore, the locus of action of insulin is extravascular; it is in the tissue cells. We must conclude that the insulin sets up some process by which, as it were, a vacuum for sugar becomes established in these cells, so that sugar is removed from the blood. One may imagine that in the tissues there exists a certain balance between the concentration of free glucose, the complex carbohydrates from which it may be derived, and the various derivatives into which it breaks down prior to its oxidation. In other words, one may speak of a certain tension of glucose as being necessary in the tissues and consider the action of insulin as having the effect of reducing this tension so that glucose diffuses into them from the blood in order to maintain it.

After about one half-hour the blood-sugar in the rabbit usually begins to rise again, or at least the fall to become much less pronounced, indicating that the effect of insulin is becoming neutralised by the liberation of sufficient glucose from the glycogen stores of the muscles and liver. This, of course, means that the hypoglycæmia following insulin will be much more prolonged and will ultimately become much more pronounced in animals provided with small reserves of glycogen than in those that are rich in glycogen. Such can readily be shown to be the case, and it is significant that a well-fed animal may withstand many times the dose of insulin that would prove fatal to one that was starved.

It is customary to imagine that the glycogenic mechanism of the liver is so finely attuned to respond to the concentration of sugar in the blood that glycogenolysis immediately sets in when this falls below the normal level. That such is not the case following insulin may depend on the fact that the glycogen, which is first of all called upon to maintain the glucose tension in the tissues, is that of the muscles themselves; but we will not here venture further into the various interesting consequences of such an hypothesis. It is at least significant that the glycogen of the muscles, as well as of the liver, is usually reduced in animals that have been given large doses of insulin (McCormack and O'Brien and Dale and Dudley). On account of its practical significance it should be pointed out that it is because of the poverty of the glycogen reserves that the blood-sugar of diabetic patients treated with insulin is more apt to fall suddenly to a dangerously low level than is that of normal persons.

The Hypoglycæmic Symptoms.

When the percentage of blood-sugar has fallen to about 0·045 curious symptoms supervene. These were first observed in rabbits, and in a typical case consist in a violent convulsive seizure in which the animal throws itself over sideways, usually first in one direction, then in the other, with the head retracted and the hind limbs in an extended position. The condition is not unlike that caused by strychnine or by acute asphyxia, except that certain groups of muscles are less affected by the convulsions than others. After a period, usually of from 30 seconds to a minute, the convulsions cease and the animal lies on its side in an unconscious state, perhaps showing running-like movements of the extremities, and with rapid, shallow breathing. The exact condition of the animal at this stage may, however, vary considerably, well-fed and therefore glycogen-rich animals often sitting in apparently normal fashion between the convulsiv seizures, which are often brought on by attempts to move. After a varying period the comatose stage i followed by another convulsive seizure, and these phases may continue alternately for an hour or more the convulsions becoming feebler and feebler and the rectal temperature falling, until at last the animal die of respiratory failure. After death rigor mortis sets in at once. The arterial blood is venous in colour, and it clots very quickly. Preceding the onset of typical convulsions there are usually premonitory symptoms of hyperexcitability and evidence of hunger; sometimes, however, paralysis of the extremities is the first symptom.

The symptoms vary somewhat in other animals In the dog the first signs are usually very rapid breathing, restlessness, and general hypersensitivity muscular twitching then becomes evident and the sphincters may relax. Barking is often a prominent symptom, and there may be frothing at the mouth At this stage, or as the first symptom, convulsions not unlike those seen in the rabbit may supervene, and between them the animal lies on its side, showing violent twitching of the musculature, almost a tetany It is evidently unconscious. The rates of breathing and of the pulse increase. Inspiration is usually short and jerky, and inspiratory tetanus not infrequent so that artificial respiration may have to be applied Attempts to get on its feet are often the cause for convulsive seizures and, during recovery, the muscles of the extremities, particularly the anterior, are seen to have entirely lost their power of coördinate action In etherised dogs even massive doses of insulin have no immediate effect on the blood pressure.

In the cat the symptoms are like those in the dog profuse salivation, mewing, and relaxation of the sphincters being especially marked.

In the mouse kept at room temperature, A. Krogh observed that insulin may only cause the animal to become weak, but its temperature falls to a very low level. If it be kept in an incubator at about 28° C., however, characteristic symptoms supervene—convulsions and coma, preceded by paralysis of the legs—with doses of insulin, which, when compared on a body-weight basis, are only about one-fifth that necessary for rabbits.

This influence of body temperature is particularly interesting, since it probably explains the apparent immunity of frogs even to massive doses of insulin. We failed to note any symptoms even in three days after injecting insulin, but A. Krogh has since found that they occur in a day or so later, a fact which we have confirmed.

In man, in whom the subjective symptoms can be interpreted and cardio-vascular changes more accurately observed, the picture is different. When the blood-sugar reaches about 0·075 per cent. the patient experiences extreme hunger and a sense of fatigue. He usually becomes anxious and may lose his emotional control. Actual tremor of the musculature is rarely seen, but there is a definite sense of tremulousness and some incoördination for fine movements. "Vasomotor phenomena are common; pallor or flushing, sometimes one after the other; a sense of heat, of chilliness, almost always a profuse sweat" (Banting, Campbell, and Fletcher). At lower levels of blood-sugar, acute mental distress, mental disturbances, delirium, and finally coma, with loss of the deep reflexes supervene.

The correspondence between the onset of definite objective symptoms and a blood-sugar percentage of 0·045 in laboratory animals is remarkable. Sometimes, as in starved animals receiving a large dose of insulin, the blood-sugar may be found to be considerably below this level when convulsions first appear. Very occasionally it is decidedly higher, and immediately after a convulsion the sugar may rise somewhat. These facts suggest that the symptoms are the result of the lowering of the tension of glucose in the tissue cells below a certain critical level—a condition of "glucatonia," we may call it—and to which the hypoglycæmia runs parallel. This view is supported the striking manner in which the symptoms are nost instantly removed by administration of glucose, d it is of great significance that other hexose nosaccharides have only a slightly beneficial effect, hough, of course, their injection causes a marked e in the reducing power of the blood. Mannose d lævulose seem to be somewhat more efficient than actose. None of the pentoses or disaccharides has y effect. Injection of epinephrin, subcutaneously, o removes the symptoms, no doubt because it cites the production of glucose out of the glycogen erves. It is of use, therefore, only when the erves are considerable, and it should not be depended on for antidoting the symptoms of glucatonia in abetic patients, because in them the glycogen stores e apt to be low. A similar relationship between the rcentage of blood-sugar and convulsive symptoms d previously been described by Mann and Magath dogs deprived of the liver; administration of glucose so removed the symptoms, other monosaccharides ving only a slight effect.

There can be little doubt, then, that the symptoms e related to a lowering of the glucose tension in the ssues. But we cannot imagine that this, in itself, is sponsible for the violent stimulation of the respiratory and muscular centres that evidently occurs. me unphysiological condition must become developed a result of the glucatonia, and it has been suggested at anoxæmia may be an important factor. Olmsted d Logan point out that there is a remarkable semblance between an insulin convulsion and an phyxial convulsion, and that the arterial blood is variably intensely venous in colour when convulsions pervene. "It may possibly be that through the wering of blood-sugar certain oxidative processes ecome depressed to such a degree that the brain cells e affected in much the same manner as in asphyxia."

Whatever may be the nature of the toxic condition, is clearly on the cells of the pons and medulla that acts. It does not, like strychnine, act on the motor ntres of the spinal cord, since insulin causes no nvulsive symptoms in a decapitate cat, although may lower the blood-sugar to well below the nvulsive level (Olmsted and Logan).

On what particular detail in the chemical structure the molecule the remarkable specificity of glucose antidoting the symptoms may depend, cannot as et be said, but it is evident that, by studying the elative antidoting value of various sugars and ubstituted sugars, we are furnished with an interesting ethod for determining the biological significance of e different side chains and of the other molecular rrangements of the glucose molecule.

The Pharmacological Assay of Insulin.

The extent to which insulin lowers the blood-sugar rms the basis for its pharmacological assay, one unit eing originally defined by us as the amount which is equired to lower it to 0·045 per cent. within four ours in a rabbit weighing 2 kg. and after 24 ours' fasting. Since convulsions supervene at this evel, their occurrence can be used as a check on the ssay, and when small animals, such as mice, are used, that large numbers can be injected with varying mounts of insulin, it can be made by observing the nset of the symptoms alone. In this case one mouse nit is defined by A. Krogh as the quantity of insulin hich can cause convulsions in 50 per cent. of the nimals within two hours, precautions being taken to aintain the body temperature and to standardise he diet. Dale and Burn have also tried this method f assay.

Even when rabbits are carefully selected so as to orrespond in weight and in every other particular, re similarly fed prior to the preliminary starvation eriod, and are injected intravenously so as to obviate ny uncertainties in the rate of absorption, the assays s judged either by the blood-sugar curve or the ccurrence of convulsions, do not always correspond. ifferences in glycogen content, which can never be ccurately adjusted, by dieting are probably largely esponsible. We have attempted to circumvent these difficulties by confining the observations on the blood sugar to the first half hour after the insulin injections, hoping in this way to circumvent the influence of the glycogen reserves, but with no conspicuous success. Probably the most accurate method of assay is that worked out in Toronto by Dr. F. N. Allen on depancreated dogs. The principle of this method, which was suggested by our clinical associates, is to determine the number of grammes of glucose that a given quantity of insulin can cause to be metabolised while the animal is on a diet containing enough carbohydrate so that there is some glycosuria. He has found that the carbohydrate equivalent of insulin, as it is called, varies somewhat with the weight of the animal and the carbohydrate balance, but that is satisfactorily constant when these conditions are made uniform. It is not likely that this method will succeed in the clinic, because of the varying degree to which different diabetic patients retain the power to produce insulin.

I have said enough about this problem of assay to indicate how difficult it is, and I will not detain you further with detail. It is probably advisable to point out, however, that it has been found advantageous to adopt, for clinical purposes, temporarily at least, a unit which is one-third that of the standard unit as defined above. This is done to obviate the necessity of prescribing fractions of a unit for the treatment of mild cases of diabetes.

The Effect of Insulin in Experimental Hyperglycæmia.

Insulin also lowers the blood-sugar in every known form of experimental hyperglycæmia, whether this be produced by the addition of glucose exogenously or endogenously. With regard to the former type, Eadie has found that when insulin is injected into rabbits coinciding with, or at varying periods preceding the injection of sugar, the curve of the resulting hyperglycæmia becomes greatly altered. When the insulin injection coincides with that of sugar the curve rises to the same height as with sugar alone, but it returns much sooner to the normal level, and when the sugar is given some time after the insulin the curve is not only of shorter duration but is also much less in height. The maximal influence of insulin in suppressing the curve is when the sugar is given at an interval of about 75–90 minutes after the insulin. At longer intervals the curves progressively rise again, the suppressing influence of insulin having, as a rule, disappeared in about eight hours. We have attempted to use these facts as the basis for a method of assay, but with no great success.

Of the endogenous forms of experimental hyperglycæmia, we have studied the effect of insulin on those due to piqûre, to epinephrin, to asphyxial conditions, and to anæsthetics, and Stewart and Rogoff have studied it on the peculiar form due to morphine. The hyperglycæmia which becomes rapidly developed in glycogen-rich rabbits in all of these conditions is greatly depressed, if not entirely absent, in animals injected with insulin, this depending, obviously, on the amount injected. Most attention has been paid to epinephrin hyperglycæmia, because in this case alone is it possible to control the intensity of the hyperglycæmia by varying the dosage. This, it will be seen, offers a method for the assay of insulin, and Eadie has found, when equal quantities of epinephrin are injected into a series of uniformly fed rabbits along with varying quantities of insulin, that there is usually a definite mathematical relationship between the dose of insulin and the extent to which the blood-sugar rises.

Further interest attaches to the antagonistic action between insulin and epinephrin, with regard to the blood-sugar, because they are both hormones, although it is questionable whether the hormonic action of epinephrin is of importance to the animal. It is significant in this connexion that Stewart and Rogoff have found that the hypoglycæmic effect of insulin is not perceptibly different in adrenalectomised as compared with normal animals, thus showing that the adrenals are in no way linked with the internal secretion of the pancreas in the control of sugar metabolism.

The observation that insulin can prevent the hyperglycæmia due to ether is of clinical importance, because it is probably on account of this hyperglycæmia that a large part of the risk of surgical operations on diabetic patients is due. It should be pointed out, however, that the hypoglycæmic action of insulin is much more readily demonstrated by having the animal well under the effects of insulin before the ether is administered, than by giving insulin to animals that are already anæsthetised. This would seem to indicate that diabetic patients should be treated with insulin before being anæsthetised, and, indeed, that this preliminary treatment should extend over several days so that the reserves of glycogen may be augmented. I am informed by my clinical colleagues that insulin is of little avail in combating post-operative coma if its administration is delayed until after the operation.

An interesting antagonism between pituitrin and insulin has been described by Burn. Given in large doses, pituitrin like insulin may inhibit the hyperglycæmia due to epinephrin or to ether, but when insulin and pituitrin are given together to normal animals, instead of there being a greater fall in blood-sugar than insulin alone would produce, there is little change or, it may be, a rise. A dose of pituitrin which in itself has little effect on blood-sugar is thus capable of neutralising the hypoglycæmic action of insulin. This observation has been confirmed by Logan and Olmsted, who have also found that it is necessary to give enormous amounts of insulin to cause any decided decrease in the hyperglycæmia which is present in decerebrate cats still retaining the pituitary gland. When this gland is absent, on the other hand, not only is the hyperglycæmia much less pronounced, as Bazett had suggested it would be, but insulin promptly lowers the blood-sugar and hypoglycæmic convulsions can readily be induced.

All of the forms of experimental hyperglycæmia just alluded to are primarily due to a rapid breakdown of the glycogen of the liver, and that produced by epinephrin may therefore be taken as a type. This does not, of course, warrant the assumption, that some have made, that a hypersecretion of this hormone is the underlying cause of the hyperglycæmia in the other forms. Indeed, Stewart and Rogoff have conclusively shown that such is not the case, with the possible exception of that caused by morphine. Taking epinephrin hyperglycæmia as a type, then, it seemed of interest to compare the amount of glycogen left in the livers of uniformly well-fed rabbits after they had been given equal doses of epinephrin, some of them at the same time also receiving insulin. This observation, made by E. C. Noble, has shown very definitely that the insulin protects the glycogen against breakdown. In one experiment, lasting eight hours, the livers of two animals receiving epinephrin alone contained 1·40 and 1·96 per cent. of glycogen, whereas those of three others which were given insulin along with the same amounts of epinephrin contained 8·12, 6·4, and 3·64 per cent. of glycogen. It is of interest to note that it was necessary to give about 40 times the usual dose of insulin to cause convulsions under these conditions, and that sometimes the convulsions occurred while there was still over 10 per cent. of glycogen remaining in the liver. The results show quite clearly that insulin antidotes the glycogenolytic action of epinephrin.

The Physiological Mechanism by which Insulin lowers the Blood-Sugar.

And now we are arrived at a stage where it will be advantageous to consider briefly the possible mechanism of the hypoglycæmic action of insulin. We have presented evidence that this is not because it stimulates increased glycolysis within the blood itself, and have concluded that insulin in some way lowers the tension of glucose in the tissue cells.

Further evidence that insulin causes the sugar pass from the circulating fluid into the tissues mo quickly than normal has been furnished by perfusi experiments on the isolated mammalian hear Hepburn and Latchford, using Locke's method, foun as previous workers have, that an average of 0·9 m of glucose per gramme of (rabbit) heart per hour di appears from the perfusion fluid. By adding insulin the perfusion fluid the average sugar consumpti rose to over 3·0 mg., and in some cases reached t value of over 4·0 mg., the highest without insul being below 2 mg. They did not find that insul affected the heart-beat, nor could they detect an significant differences in the glycogen content of t hearts used in the two groups of experiments.

Hoping to be able to demonstrate a similar effect insulin on the sugar content of fluid perfused throu skeletal muscles, these workers attempted to perfu the hind limbs of various laboratory mammals, b although every possible precaution was taken avoid interruption of the circulation prior to startin the perfusion, or a fall in temperature, they coul never succeed in preventing either marked œdema vaso-constriction. This failure led them to compa the sugar concentration of blood removed at the sam time from the femoral artery and vein, and from th portal vein, of anæsthetised or decerebrated animal and to see whether insulin would cause the differenc normally existing between these bloods to becom changed. It was found not to do so. McCormac has since found that this method is also incapable o revealing an increased retention of glucose as a resul of insulin, either in the muscles or in the liver depancreated animals, in which, as we have see insulin certainly causes glycogen to be formed. Thi shows that the method is not sufficiently sensitive fo the purpose for which it was employed.

The evidence of the observations on glycolysis an the perfused heart leave little doubt, however, tha the glucose is lost in the tissue cells, and the proble narrows itself down to the cause for its disappearanc The possibilities that may be considered are: it polymerisation into glycogen, its oxidation, and it reduction to substances similar to fatty acids.

With regard to its possible conversion into glycogen the fact that insulin causes large amounts of this polysaccharide to become deposited in the liver of depancreated animals when they are fed on carbohydrate would seem at first sight to lend support. But th conditions, as already pointed out, are fundamentall different in the normal organism. As a matter o fact, it has been shown that insulin given to norma rabbits, instead of causing glycogen to be deposited has the opposite effect, and either prevents th deposition of glycogen when it is given alon with carbohydrates to previously starved animal (McCormack and O'Brien), or causes the stores o this substance to become reduced when given t well-fed animals (Dale and Dudley).

Further evidence that insulin does not stimulat formation of glycogen in normal animals has bee obtained by Noble by perfusion experiments on th liver of the turtle. When each of the two lobes i perfused for several hours with Ringer's solutio containing glucose, under exactly similar condition except that the fluid on one side contains insulin, th relative amounts of glycogen in the two lobes wer found to be the same as they usually are. Since th normal variation may be considerable, the method i not a very delicate one, and on this account Nobl has also used that of observing the sugar content o the perfusion fluid, as recommended by Snyder, Martin, and Levin. By comparing this for equal periods of time, with and without the addition of insulin, no differences could be detected. The only objection to the experiment is that insulin may not act quickly enough in the case of cold-blooded animals to make it possible in the time of perfusion for measurable quantities of glycogen to be deposited.

Clearly, therefore, none of the disappearance of sugar from the blood of normal animals which follows the injection of insulin can be accounted for by its ymerisation to glycogen. Why, then, does insulin se glycogen to be deposited in the diabetic animal, why does it inhibit the breakdown of glycogen in erimental hyperglycæmia? The reply, based on considerations already set forth, is that an excess insulin beyond that actually required for the trol of carbohydrate metabolism develops towards cogen, an action which is the reverse of that which has under normal conditions. When insulin is en to the diabetic animal, on the other hand, it plies a previously missing agency necessary for oxidation and polymerisation of glucose. To lain the retarding effect which insulin has on cogen breakdown in experimental hyperglycæmia, may suppose that the sugar which is produced by s process is a mixture of active and inactive forms, that insulin, by tending to produce the former in ative excess, disturbs the balance existing between sugars and glycogen, so that less glycogen is ken down. This suggestion assumes some sort of anced action between glycogen and its hydrolytic ducts, for which, however, there is no experimental dence.

he possibility that glucose disappears because cess of insulin causes its oxidation to be increased been investigated by observing the respiratory change. In the experiments of Dixon, Eadie, and mber, dogs and rabbits were used. In the former, results show that insulin causes a very marked rease in oxygen consumption and in respiratory lume and rate, but very little change in the respiray quotient. These changes do not, however, begin be evident until from 30–60 minutes after giving insulin, by which time the blood-sugar has npleted its initial fall and stands at about 0·060 per t., which indicates that the sudden call for sugar the part of the tissue cells cannot be attributed its increased oxidative breakdown. There can be tle doubt that the increased metabolism is dependent on the hyperexcitability and the increased muscular ne of the animal. It reaches its acme when conlsions supervene, and it develops either steadily intermittently. Evidently, as the tension of glucose clines, conditions become established within the rve centres which excite them and which may be pendent upon an intracellular lack of oxygen. at the development of the symptoms depends on e lowering of the glucose tension is supported by e observation that their severity is lessened by the jection of glucose.

In rabbits, in which it will be recalled increased scular tone is not so marked a symptom as in dogs, e increase in oxygen consumption does not set in til the convulsions occur—indeed, there is often, not usually, a drop both in this and in respiratory lume. Sometimes in rabbits the respiratory otient rises decidedly. It would be rash at this ge to draw definite conclusions from these results, t it is quite plain that the initial fall in blood-sugar, ich is primarily what we must attempt to explain, not due to any increased combustion of glucose.

The remaining possibility that glucose is reduced substances related to the fatty acids receives some pport in certain of the observations from the haviour of the respiratory quotient. This may rise over unity without there being any sufficient degree hyperpnœa, and of consequent "washing out" of $)_2$ from the blood to account for it. To be quite rtain of this latter possibility, Dixon and Pember ve examined the blood removed from dogs at gular, frequent intervals after giving insulin without ding that there is any significant change in the $)_2$-combining power. This observation, by the y, also shows that there can be no production of id substances as a result of insulin, a fact which s also been demonstrated by F. N. Allen from servations on the behaviour of the acid excretion way of the urine.

We are, therefore, at a loss to explain the cause for e initial disappearance of sugar from the blood; is not converted into glycogen, its oxidation in the sues is not augmented, at least until after increased muscular activity sets in, and if some of it does become reduced to fat-like substances this is not an invariable process.

The Source of Insulin in the Higher Animals.

The evidence that insulin is derived in the higher animals from the islets of Langerhans and not from the acinar (zymogenous) cells of the pancreas has, until recently, been of an indirect nature. Continuing the work of Diamare and Laguesse on the comparative anatomy of the islets of Langerhans, Rennie, in 1905, described in detail their relationship to that of the zymogenous tissue in numerous Teleostei. He found, particularly in *Lophius piscatorius*, Myoxocephalus, and the Pleuronectidæ, that the islet cells exist as separate encapsulated glands lying in the mesentery quite distinct and apart from the bulk of the zymogenous tissue, which is usually spread as narrow bands along the branches of the mesenteric blood-vessels. These glands he called principal islets, and he found the largest of them to be situated near the anterior pole of the spleen.

Although the more recently discovered methods of differential staining for islet cells have not been successfully applied to the principal islets, no one has doubted the conclusion of Diamare and Rennie that they are homologous with those of the islets of Langerhans of the mammalian pancreas. The absence of these structures in the zymogenous tissue in the Teleostei supports this view, as does also the fact that in the Elasmobranchi, in which there are no principal islets, the pancreas itself, which is a compact gland, contains abundant islet tissue. In collaboration with Fraser, Rennie investigated the effect of the principal islets, administered by mouth, on diabetic patients, but without results that could be considered to show definite amelioration of the symptoms. In one case an extract of the gland was injected subcutaneously, but the development of toxic symptoms made a repetition of the experiment inadvisable. In view of the now well-established fact that insulin is quite inactive when given by mouth, it is clear why these earlier observations should have failed to yield satisfactory results. Recently, we have reinvestigated the problem, and have found very definitely that alcoholic extracts of the principal islets cause a profound lowering of the blood-sugar of the normal and diabetic animals, including man, when they are injected subcutaneously or intravenously, whereas similarly prepared extracts of the zymogenous tissue have no such effect—indeed, not infrequently, rather cause the percentage of blood-sugar to increase. In contrast to these results, an extract of the pancreas of the skate, which contains islet tissue, has a marked insulin effect,[2] and so also had one prepared from the intercæcal fat of the trout (in which the islets and zymogenous tissue lie separately embedded). The islets are, therefore, the only source of insulin in the bony fishes, and we may conclude that they are also so in the mammals, since in them none of this hormone is produced after pancreatectomy.

This conclusion is supported by the experiments on duct ligation and on grafting already referred to, and by the experiments of Banting and Best, although in all of these there still remained the possibility that partially-degenerated or regenerated zymogenous tissue might be the source of the hormone.

Much attention has been given in recent years to the mechanism of the control of the secretion of glands producing internal secretions, and, since many of those concerned in the production of the external secretions are under nerve control, it has been supposed that this must also be the case with the ductless glands. It cannot be said, however, that much success has attended the various endeavours to demonstrate this nerve control. Since the islets of Langerhans are provided with a rich nerve supply, which is believed to come in large part from the right vagus, and since an increased discharge of their internal secretion, insulin, would be revealed by the behaviour of the blood-sugar, McCormack and O'Brien have investigated the effect which is produced on the latter by electrical stimulation of the right vagus, in decerebrate cats and in etherised dogs and rabbits. To avoid cardio-inhibitory effects, the nerve has either been stimulated below the origin of the cardiac fibres, or it has been allowed to undergo partial degeneration. The fact that hyperglycæmia follows stimulation of the great splanchnic nerve further suggests the possibility that hypoglycæmia might result from stimulation of the vagus.

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[2] These extracts have an unusually marked effect in causing violent convulsions.

Similar observations were made some years ago by de Corral working in Asher's laboratory, with results which are at least suggestive. Those of the present investigation are more definite, although not entirely convincing. In many cases no change can be detected in the level of the blood-sugar following the stimulation but in several others there is a prompt fall, which is usually of a temporary nature, in spite of continued stimulation. In one or two cases, however, stimulation with slow, weak induced shocks for a long period has caused a gradual decline in blood-sugar, in one case to 0·070 per cent., with a return towards the normal level after removal of the stimulus. It is of great interest in connexion with these experiments that Best and Scott have recently discovered that insulin can be prepared from blood by the usual methods.

The Chemical Reactions and the Preparation of Insulin.

Before concluding, allow me to say a few words concerning the methods used in the preparation of insulin and its chemical properties, in so far as these are known at present. The method of preparation developed by Collip depends on the solubility of insulin in concentrations of ethyl-alcohol up to about 90 per cent., above which it becomes precipitated. Since most proteins are insoluble at concentrations of alcohol that are considerably below this, they can be removed from the original extract of pancreas (which is made with 50-60 per cent. alcohol) by fractional precipitation after the extract has been concentrated by evaporation in vacuo. A watery solution of the precipitate which settles out at a concentration of 90 per cent. alcohol is insulin. It can be evaporated to dryness in vacuo without loss of potency, and the powder contains about 14 per cent. of nitrogen, is free from phosphorus (Doisy, Samogyi, and Shaffer), but contains sulphur. A solution gives a distinct biuret test, but only faintly, those of Millon and Hopkins-Cole. The insulin is readily absorbed by kaolin and charcoal, and considerable losses are apt to occur in passing it through a porcelain filter. It does not dialyse through membranes or collodion sacs; it is precipitated by half-saturation with ammonium sulphate, by barium salts of weak acids, and by picric acid. The solubility in water and alcohol is determined by the H-ion concentration, the iso-electric point being at a pH between 5 and 6. Watery solutions at a pH below 5 can be boiled for several hours without any loss in potency, but this occurs more rapidly when the pH is about 7. The potency quickly vanishes in the presence of pepsin or trypsin. In acid solution insulin is relatively stable to mild oxidising and reducing agents. Insulin is also soluble in phenol and the cresols, glacial acetic acid, and formamide. It is insoluble in most other organic solvents (Malony).

These reactions, and its destruction by pepsin and trypsin, suggest that insulin is of the nature of an albumose, but it is possible that it is really only adherent to this protein, and is itself of much simpler chemical structure. This view is supported by the fact that we have been unable on several occasions to detect any biuret reaction with insulin prepared from the pancreas of the skate or to obtain from this source precipitates containing it by means of high concentrations of alcohol, or by adjustment of the iso-electric point. Whether it is really a protein or not, it is significant that all the methods now used for its purification are based on reactions that are characteristic of colloids. Thus precipitation at the iso-electric point (Doisy, Samogyi, and Shaffer), or by picric acid followed by the regeneration from the picrate as hydrochloride (Dudley), or by benzoic acid (Malony or by half saturation with ammonium sulphate. is highly creditable to those who have been responsib for producing insulin on a large scale for clinical u that they should have succeeded in so short a time i their work.

It may be assumed that insulin is present in a animals, and since structures similar to the islets o Langerhans have not been described in the invertebrates, it is likely that in them its site of production delegated to other structures. What these may be i the more highly-developed invertebrates is as ye undetermined, but it is of interest that Collip, shortl after isolating insulin from mammalian pancrea prepared it from clams, and suggested that it must b present wherever glycogen is found. Later he prepare a substance like it from yeast, thus confirming Winte and Smith. The insulin prepared from these source appears to differ from that prepared from pancrea in that its action in lowering the blood-sugar i delayed, sometimes for a day or so, which is also th case with an insulin-like substance prepared by Colli from various vegetable sources and styled by him, i recognition of these differences "glucokinin." Bes and Scott have also succeeded in preparing insulin, o insulin-like substances, from various other sources It would appear, therefore, that the distribution o hormones capable of accelerating the disappearanc of glucose from the blood is widespread, not only i the animal kingdom but in the vegetable as well, bu it is probable that these do not all have the sam physiological action. In the investigation of this w must bear in mind that many substances have bee known for long to be capable of lowering the blood sugar; for example, peptone, hydrazin, certai mineral salts, phlorhizin, &c. All of these also caus glycogen to disappear from the liver, and, indeed certain of them cause structural changes in this organ Although it would certainly be desirable to hav substances like glucokinin having a more prolonge action than insulin in depressing the blood-sugar, w must exercise some caution in recommending them for clinical use until it is certain that they have n deleterious effects on the liver. It is possible als that these substances merely stimulate the secretio of insulin from the pancreas of the animal into which they are injected, or serve as precursors for its production. If such be the case, then they can have littl value in diabetes.

I have endeavoured in this review to adhere strictl to ascertained facts, and have refrained from venturin to speculate with regard to the numerous problems in metabolism, both of animals and plants, for th investigation of which insulin may prove a usefu instrument. If I have succeeded in giving you a bird's-eye view, as it were, of the results that have been obtained, I shall consider that my efforts have not been in vain, and I shall feel repaid if, as an outcome, others join us in the work on insulin.

King's College Hospital Festival Dinner.—The Festival Dinner of King's College Hospital was held o July 17th at the Savoy Hotel, the Duke of Connaught in the chair. The Duke of Connaught, in proposing the toast o the hospital, spoke of the anxiety given by the presen position of the London hospitals to those whose duty anc privilege it was to conduct their work, and referred to the fact that King's College Hospital was the first that gave accommodation as a military hospital (No. 4 London Genera Hospital) during the war. During the time when the hospita was in military hands some 31,000 soldiers passed through its wards, together with 11,000 civilians; over 370 past and present members of the medical school, and over 150 trained nurses served with the forces. Unfortunately the war occurred at the time when the appeal for the new hospital was being made, and the building debt at the end of 1922 amounted to £73,000. He associated with the toast of the hospital the name of Viscount Hambleden, its chairman. Viscount Hambleden, replying, emphasised the value of the voluntary hospital system, and stated that during the past year the 5600 in-patients and 42,000 out-patients had themselves given £13,000 towards the cost of their maintenance. At the close of the proceedings the Duke of Connaught announced that £6000 had been subscribed during the evening.

Medical News.

UNIVERSITY OF LONDON.—A meeting of the Senate s held on June 18th, the Vice-Chancellor, Mr. H. J. Waring, ng in the chair. Regulations were adopted for the degree Bachelor of Dental Surgery for external students. Grants re made out of the Thomas Smythe Hughes Medical search Fund for the year 1923–24 as follows: 1. To Dr. elyn E. Hewer, D.Sc., and Mrs. Lucas Keene, M.B., B.S., ntly, £100 for an investigation of the human fœtus with a w to establishing the normal development of organs, their rmal microscopical structure at all ages of development, scope of "physiological" variations, and the effects of rious abnormal factors. 2. To Dr. H. M. Woodcock, Sc., £50 for an investigation in the study of blood-digestion tissue-cells along histological lines; especially at the esent time, in connexion with the increased development the mammary gland during pregnancy and the formation milk.

The Committee of the medical members of the Senate have elected Mr. Raymond Johnson to be their chairman for 23–24.

At examinations held recently the following candidates re successful:—

M.D. EXAMINATION.

Branch I., Medicine.—Archibald G. Duncan, London Hosp.; Robert Ellis, Birmingham University and St. Bart.'s Hosp.; David M. Lloyd-Jones, St. Bart.'s Hosp.; and Olive Rendel, London (R.F.H.) Sch. of Med. for Women.

Branch III., Psychological Medicine.—Philip C. P. Cloake (University Medal), London Hosp.

Branch IV., Midwifery and Diseases of Women.—Thomas G. D. Bonar, Guy's Hosp; Mariamne O. Ramsay, London (R.F.H.) Sch. of Med. for Women; and Philip J. Veale (University Medal), Univ. Coll. Hosp.

Branch V., State Medicine.—Eric W. C. Thomas, St. Bart.'s Hosp.

Branch VI., Tropical Medicine.—Gordon Covell, Guy's Hosp. and London Sch. of Trop. Med.

M.S. EXAMINATION.

Branch I., Surgery.—Michael W. B. Bulman, London Hosp.; and Esther Rickards, St. Mary's Hosp.

UNIVERSITY OF MANCHESTER.—At examinations ld recently the following candidates were successful:—

THIRD M.B., CH.B. EXAMINATION.

Pathology.—R. S. Adam, J. H. Anderson, J. K. Barr, C. V. Brown, Stella H. Brown, H. H. Bullough, Margaret A. Bromhall, W. C. V. Brothwood, T. A. Brown, Elsie Catlow, William Chadwick, S. F. Clegg, Geoffrey Coope, Jenny D. Craig, Joseph Crowther, J. A. Crowther, A. F. C. Davey, T. E. Davies, Stanley Devine, Kathleen Dickinson, Florence M. Duckworth, Reginald Ellis, R. A. Ferguson, C. R. Fielding, Miriam Florentin, A. G. Forbes, J. B. Fulton, J. W. Graham, Philip Gregory, James Haslam, G. H. Hayle, A. H. Heyworth, Edward Holmes, Winifred L. Horton, J. N. Hudson, Elizabeth G. Humble, E. P. Johnson, P. G. Johnson, Phyllis I. Kaufmann, David Kemp, Barbara M. Knight, G. F. Langford, E. M. Liddle, Hilda M. Linford (with distinction), F. R. Lockhart, A. M. Macgill, G. H. March, Ethel Morris, William Mottershead, Alice M. Orrell, R. M. Pearce, Henry Penman, Samuel Pope, L. J. Prosser (with distinction), Albert Riley, T. W. Rothwell, B. R. Sandiford, Eileen Sheehan, Joseph Shlosberg, H.T. Simmons, John Sims, A. B. Slack, G. S. Smith, A. R. Somerford, Lois Stent, R. F. Stubbs, James Troup, H. M. Turner, C. L. Walker, Ronald Walshaw, S. E. Ward, Samuel Whalley, Hugh Whittle, Charles Wilcocks, R. M. Williams, Geoffrey Williamson, S. P. Wilson, K. K. Wood, P. B. Wood, Frank Yates, J. M. Yoffey, and N. A. J. Young.

Pharmacology.—Louise Aronovitch, H. K. Ashworth, Marion L. Bainbridge, A. R. Barber, C. H. Bamford, J. R. Beal, R. H. Blackburn, N. W. Bolton (with distinction), Lilian Bond, G. H. H. Booth, Kathleen M. Boyes, Marguerite E. Cliff, John Crook, T. A. Danby, R. S. Davidson, A. A. Davis, N. E. Delaney, Harriet M. Dick, Florence M. Duckworth, L. F. Evans, Leo Fay, S. J. Firth, Beatrice N. Fletcher, Harris Galley, Riad Girgis, J. S. Goller, Mary Harburn, Barnett Hirsh, G. D. Hithersay, J. L. Holt, R. L. Holt, John Hunt, May Johnson, Walter Johnson, G. W. Jones, T. J. Kay, J. T. C. Keddie, James Kemp, H. B. Kilroe, J. H. Kitson, Annie E. Mackintosh, E. A. Marson, W. D. Mitton, G. S. de W. Moll, S. L. Mucklow, R. J. Owen, Archer Pearson, Harry Pigott, R. H. Poyser, Joan Robinson, M. R. Sagar, N. F. Seed, Raphael Shaffer, W. H. Shepley, W. S. Slater, Agnes G. Smiley, F. H. Smirk (with distinction), Jane B. Stubbs, J. K. Thomas, Olive de la W. Turner, J. C. Wilson, and Reginald Wood.

The following awards have been made:—Platt Physiological holarship: E. C. Smith. Dauntesey Medical Scholarships: rst, A. H. Baker; second, R. Newton. Graduate Prize in edicine: L. J. Witts. Sidney Renshaw Prize in Physiology: . Whitehead. Dumville Surgical Prize: L. J. Witts. Uni- ersity Prize in Medicine: Kathleen Sheehan.

UNIVERSITY OF PARIS.—A holiday course of postgraduate instruction in diseases of children will be held at the medical clinique of the Hôpital des Enfants Malades, 149, Rue de Sèvres, Paris, from August 20th to Sept. 8th inclusive, under the direction of Prof. P. Nobecourt and Mr. P. Lereboullet.

ROYAL SANITARY INSTITUTE.—As announced last week, the thirty-fourth Congress of the Institute, together with an exhibition of apparatus and appliances relating to public health, will take place at Hull from July 30th to August 4th, under the presidency of the Rt. Hon. T. R. Ferens, High Steward of Hull.

ROYAL COLLEGE OF PHYSICIANS, EDINBURGH.—The Dr. Jessie MacGregor Prize in Medical Science (50 gs.) for the present triennial period has been awarded by the trustees to Miss May Laurie Walker, M.B., Ch.B. Edin., of the Department of Physiology in the University of Edinburgh, for her record of work on the anatomy and physiology of the depressor nerve.

PAYMENT OF PANEL DOCTORS IN CHESHIRE.—At a meeting of the Cheshire Insurance Committee held on July 19th a discussion took place on the Medical Benefits Subcommittee's recommendation that in future the capitation system of remuneration of insurance practitioners in Cheshire be discontinued in favour of payment by attendance. The committee decided by 19 votes to 7 to pay on the attendance system in the future.

SCOTTISH BOARD OF HEALTH: PRECAUTIONS AGAINST SMALL-POX.—Regulations have been issued making chickenpox compulsorily notifiable in Scotland until the end of the year. This step is taken because of the possibility of the introduction of small-pox into this country. The Board have suggested to the local authorities that they should ask the medical practitioners in their district to seek the coöperation of the medical officer of health in dealing with any illness that has even a remote resemblance to small-pox.

REGULATIONS FOR LABELLING DRIED MILK.—It is announced that the Minister of Health is about to make regulations as to the labelling and composition of dried milk on the lines of the regulations recently made with regard to condensed milk. The regulations will come into operation on Jan. 1st, 1924, and will apply to all dried milk intended for sale for human consumption in England and Wales. Copies of the draft Regulations, which have been prepared for this purpose, can be purchased under the description "Draft of the Public Health (Dried Milk) Regulations, 1923" from H.M. Stationery Office, Imperial House, Kingsway, W.C. 2, price 2*d.* Any representations on the subject should be addressed to the Secretary to the Ministry at an early date.

PEOPLE'S LEAGUE OF HEALTH.—At a recent meeting between representatives of the Trades Union Congress General Council and a deputation from the Medical Council of the People's League of Health, the proposal that the machinery of the League shall be utilised for the health education of the workers of the country was discussed. Among those present were Sir Alfred Fripp, Sir Frederick Mott, Sir Harry Baldwin, Prof. C. S. Myers, Dr. Jane Walker, and Miss Olga Nethersole.

Introducing the deputation, Sir Alfred Fripp asked that a resolution should be included in the agenda of the Trades Union Congress to be held at Plymouth next September calling the attention of the delegates to the need for health education, and to the offer of the People's League of Health to act as the official health educational channel. Sir Frederick Mott pointed out that while education on bodily health was increasing steadily, that which affected mental health was almost entirely neglected. The asylums of the country were full to overflowing with cases of insanity that might have been prevented if the necessary measures had been taken in time. Sir Harry Baldwin said that much disease was caused through the neglect of the teeth, and one of the commonest causes of bad teeth was incorrect diet. Dr. Jane Walker said that a *small* deviation from good health should be regarded as of equal importance with a large one. For instance, a slight loss of weight and general listlessness might be the earliest symptoms of consumption. Prof. Myers said that health education was not only necessary from the employers' point of view, but actually meant larger profits. If a factory was losing money it meant inefficiency somewhere. In nine cases out of ten that inefficiency was caused through the workers not being properly cared for. Insufficient light, insufficient leisure, insufficient air, and anything else that had an adverse effect on health made workers sullen and discontented, and resulted in a diminished output. Miss Olga Nethersole, the founder and hon. organiser of the League, suggested that all patients under the panel system should submit themselves for medical and dental examination at least twice a year.

Parliamentary Intelligence.

HOUSE OF LORDS.

THURSDAY, JULY 19TH.

Smoke Abatement.

The Earl of ONSLOW introduced a Bill the object of which is to amend the law relating to smoke abatement. The Bill was read a first time.

Therapeutic Substances Bill.

Lord ONSLOW also introduced a Bill entitled the Therapeutic Substances Bill, to provide for the regulation of the manufacture, sale, and importation of certain vaccines, sera, and other therapeutic substances. The Bill was read a first time.

Sale of Liquor to Children.

Viscount ASTOR, in moving the second reading of the Intoxicating Liquor (Sale to Persons under Eighteen) Bill, which has passed through the House of Commons, denied that it was a class measure or that it was a step towards prohibition. He pointed out that Sir Thomas Horder, a prominent member of the Anti-Prohibition League and a distinguished member of the medical profession, together with three other distinguished physicians and surgeons, wrote to the *Times* supporting the Bill and urging its passage. He claimed that there was behind the Bill an overwhelming measure of public support.

Lord DAWSON OF PENN said that he would have been more happy if he had heard from Lord Astor one word of grudging approval of alcohol for people of any class whatever. One could not shut one's eyes to the fact that quite a large proportion of the people who supported this Bill were people who looked upon alcohol as a harmful thing in itself and therefore specially harmful for youths and adolescents. Alcohol was without doubt a food, but that it was a good and effective food in health no sensible person would contend, whatever it might be in sickness. His own view and that of others was that alcohol was a stimulant, though only for a transient period. Its chief effect was on the nervous system. Anyone who referred to it as a narcotic was a scientific philistine, and either his personal experience had been unfortunate or they might console themselves with a thought that after he had called it a narcotic he might presently be seen at home enjoying a glass of old port. To call alcohol a narcotic was a misnomer. In excess it might be a narcotic, but in moderation it added to the pleasure, the exhilaration, the happiness, and the gaiety of life. In the conditions of modern civilisation, in these days of concentration with the constant endeavour to put 12 hours into six, the higher measure of specialisation in modern employment, it was obvious that at the end of such a day the mind of a man got into one track. It was there that the value of alcohol came in. In moderation it got the man out of the track, lightened his mental touch, and enabled him to travel from one topic to the other. He happened to be at a public dinner not very long ago when the centre table consisted almost entirely of prohibitionists, among them several high ecclesiastics of the Church. It was the one dull grey spot in the whole of that dinner, and if anyone wished to be converted to an uncompromising condemnation of prohibition they would have been converted by that scene. There were a number of people who at the end of a fatiguing day were quite unable to digest their food because their nervous system was too tired. A small quantity of alcohol made them happy with themselves and happy with the world. In the particular phase of civilisation we were passing through there had been no time when alcohol, properly taken in proper quantities and in moderation, could serve a more useful purpose. The second effect of alcohol —namely, narcotism—followed in youth very much more quickly than in adult years. The argument for this Bill was that youth did not require alcohol ; if it got into one track it got out of it quickly—sometimes too quickly. If the true uses of alcohol were more readily recognised by reformers their influence would be considerably greater. An enormous deal depended on the quality of alcohol. They might take alcohol in absolute purity and dilute it and drink it, and they would get effects totally different from those which followed drinking a good glass of wine or beer. They might submit the samples to analysis, and they would find no difference between the one and the other. The qualities of good wine and beer were due to traces of unponderable substances which might be compared to vitamins in food. The whole good effect of alcohol depended on moderation. He thought it would be universally admitted that moderation was progressing by leaps and bounds. He had got out the figures of a large hospital in London for ten years, and he selected two diseases which were exclusively produced by alcohol. In 1900 there were 39 cases of sclerosis of the liver admitted into that hospital ; in 1920 there were seven. He then selected an alcoh disease peculiar to women, and he found for 1900 there we 19 such cases and in the year 1920 only one. Take all t diseases due to alcoholism in that hospital per 1000 of t male patients. In the year 1900 there were 5 per 100 in 1910 4 per 1000, and in 1920 under 1 per 1000. It seeme to him only logical that they should protect youth fro alcohol, and with that *caveat*, that this Bill did not car with it any condemnation of alcohol as such, he supporte its provisions. The second reading of the Bill was agreed t

HOUSE OF COMMONS.

WEDNESDAY, JULY 18TH.

Grants to Local Authorities.

THE House went into Committee on the Expiring La Continuance Bill, Captain Fitzroy in the chair.

Mr. WILLIAM WATSON said that the duties of medic officers and sanitary inspectors had increased very considerably during the period of the war and since. Quite number of Acts of Parliament had been passed increasin those duties, with the result that the salaries of these officia had been increased during the past few years. By t Local Government (Emergency Provisions) Act, 1916, t grants given by the Government were stereotyped and the stood at the same figure to-day as they did in 1915, and h appealed to the Government to strike this provision out this Bill so that the local authorities in Scotland might g the relief to which they were entitled.

Captain ELLIOT (Parliamentary Under-Secretary of Healt for Scotland) said that by dropping this provision in t present Bill, as suggested by the hon. Member, they woul not increase the sum allocated to Scotland for payment grant-in-aid of rates. The question of grants in relief local rates was under consideration by an estimates committee, and he had every hope that this was the last yea that they would bring forward a provision of this kind.

Coroners and Juries.

Lieut.-Commander KENWORTHY moved to omit Section of the Juries Act, 1918, as amended by 12 and 13 Geo. 5, c. This section gave power to a coroner to dispense with a jur altogether. It therefore lay with the coroner to suspe murder or manslaughter. He suggested that the coron might not be seized of all the circumstances.

Sir KINGSLEY WOOD said he would like to see the old jur system reverted to because he thought it was one of the be features of English law.

Mr. F. GRAY said that under the Coroners Act of 1887 th coroner had considerable power in determining whether ther should or should not be an inquest in a particular cas He had always been impressed by the fact that a larg percentage of the cases in which inquests were held wer in respect of poor people and workers. The reason wa two-fold. First, it was only when an inquest was held tha the doctor who had been called in was able to get the substantial fee of 2 guineas for conducting the post-morte examination, with an additional guinea for attending to giv evidence at the inquest. The second reason was that in large number of cases where a sudden death occurred in th house of a well-to-do person it was notorious that ver considerable pressure was brought to bear on the coroner t induce him to abstain from having the unpleasant publicit of an inquest. The power conferred by the Act of 1887 i this respect was probably too wide. When an inquest wa held and a jury was called together, if it served no othe purpose, it brought publicity to bear on the matter in hand

Mr. G. LOCKER-LAMPSON (Under-Secretary to the Hom Office) agreed that this was a very important questio The section under review was, however, put down originall as a war measure in order to avoid having to summon mor people than was necessary. It had been found very useful had saved a great deal of expense, had worked perfectl smoothly, and had given general satisfaction to the public The coroner had not to take power to dispense with jury unless the circumstances of the case justified it. H thought that that was really a sufficient safeguard so far a this temporary measure was concerned. He believed tha a promise had already been made that legislation was going t be introduced to consolidate and amend the law relating t coroners, and when the time came an amendment of thi particular Section 7 of the Act of 1918 would be very carefull considered.

After further discussion the amendment was negatived b 214 votes to 157.

Visit of Distinguished Russian Scientist.

Mr. RILEY asked the Under-Secretary of State for Foreig Affairs if he was aware that the distinguished Russia scientist, Pavlov, invited to attend the Edinburgh Congres on Physiology, had been refused the visa to his passport b the British consul in New York, and what was the reason o reasons for such refusal.—Mr. LOCKER-LAMPSON (Under cretary for the Home Office) replied : My right hon. end has no information as to the refusal of a visa to of. Pavlov in New York. I understand, however, that he s already sailed from America, and no obstacle will be ced in the way of his landing in this country to attend the ngress on Physiology at Edinburgh.

Milk-feeding Experiments.

Mr. Hurd asked the Minister of Health whether he could te in general terms the results of the milk-feeding experi- nts among Birmingham council school-children, showing e physiological value of fresh milk as an article of diet, and rticularly the effect on children suffering from malnutrition the addition to their dietary of a pint of fresh milk daily, d whether he would cause to be prepared and published report on the experiments for the encouragement of öperative movements of the same kind between other ucational, agricultural, and health authorities.—Mr. eville Chamberlain replied : It would not be possible thin the limits of an answer to a question in this House to te even in general terms the results of the experiments erred to in the first part of the question. As regards the cond part, I think the question of publishing a report on the sults of these experiments is a matter for the authority sponsible for the investigation. I may add that the nistry of Health, in conjunction with the Medical Research uncil, are conducting investigations into the nutritive operties of milk in the feeding of children, and the question issuing a report on these investigations will be considered.

Poor-Law Officers' Superannuation.

Mr. Hayday asked the Minister of Health whether he was are that an employee in a fever hospital paid for super- nuation under the provisions of the Poor-Law Officers t ; that if for any reason the employee was transferred to mental hospital, even if it was controlled by the same thority, he came under the Asylum Officers Act for perannuation purposes ; that as there were no provisions either Act for transfer value the employee lost credit for the payments he made under the Poor-Law Officers Act though if he were dismissed instead of transferred he uld get his payments returned, and whether he would take tion to bring these two Acts into conformity with the ovisions of the Local Government and other Officers perannuation Act, 1922.—Mr. Neville Chamberlain plied : I am aware of the difficulty to which the hon. ember refers, but I am afraid I cannot promise to introduce gislation dealing with the matter at the present time.

Houses under the New Bill.

Captain Wedgwood Benn asked the Minister of Health e number of houses approved for construction to date der the new Bill.—Mr. Neville Chamberlain replied : e number of houses approved to date which will rank for sistance under the new Bill is 16,215.

Small-pox Commissioners.

Mr. Albert Bennett asked the Minister of Health the mber of small-pox commissioners appointed at present the country and the districts in which they were operating, d what were their duties and the degree of coördination ey observe with respect to the medical advisers of local thorities.—Mr. Neville Chamberlain replied : There pears to be some misapprehension as to the nature of the rangements to which the hon. Member refers. These rangements have been made solely with a view to securing omptly an accurate diagnosis in suspected cases of small- x. In ordinary circumstances, if the doctor in attendance on a patient and the local medical officer of health are ubtful whether the case is one of small-pox, arrangements e made if possible for one of the medical officers of my partment who have special experience in the diagnosis of e disease to see the patient in consultation with the actitioner and the medical officer of health. The recent tbreaks of small-pox have rendered it necessary that me further assistance should be available for the diagnosis doubtful cases, and I have secured the services of 12 edical men residing in different parts of the country, ch of whom has special knowledge and experience of nall-pox, to visit suspected cases when assistance is sought om my department and the services of medical officers of e Ministry are not immediately available. The sole object these visits is to assist in diagnosis, and the medical men ho have been appointed endeavour in each case to arrange see the patient in consultation with the medical attendant d the local medical officer of health.

Thursday, July 19th.

Medical Boards and Final Awards.

Mr. Whiteley asked the Minister of Pensions whether, eing that out of 13,023 cases heard by the assessment peal tribunal in the six months ending Dec. 31st, 1922, e assessment was increased in 2500 cases and the final vard set aside in 2500 cases, he would issue instructions to the members of final award boards that in arriving at their decisions every regard must be paid to the prospective condition of men suffering from a temporary or permanent disablement due to war service, and whether he would withdraw Supplement No. 3*b* to M.P.M.S.D. 57, informing the boards that they were expected to make final awards.—Major Tryon replied : The medical boards concerned have already been instructed in the sense suggested by the hon. Member in the first part of his question. I am not prepared to adopt the suggestion in the last part of the question. The instruction referred to was issued in the interests of disabled men for the reasons which I stated in the course of debate on Committee of Supply on the 5th ultimo.

Allowances for Home Treatment.

Mr. Herriotts asked the Minister of Pensions whether, in all cases where a pensioner was recommended home treatment with allowances, the recommendation was referred to a deputy commissioner of medical services ; whether he had power to veto such recommendations ; whether any record was kept of the number of cases where authority to pay allowances is refused ; and, if so, would he give the number of men who were recommended home treatment with allowances but did not receive allowances in the three months ending March 31st.—Major Tryon replied : Certificates given by Ministry institutions and clinics are not referred to a deputy commissioner of medical services, but where the examination has been conducted by an out-station medical officer his recommendation is referred to a deputy commissioner. The latter never disturbs a recommendation of allowances without personally seeing the man unless the examining medical officer agrees, on reconsideration of the case, that allowances are not admissible. I regret that the figures asked for are not available, as no record is kept of these decisions other than in the man's personal file.

Medical Commissioner and the Welsh Language.

Mr. Robert Jones asked the Minister of Pensions whether the deputy commissioner of medical services (tuberculosis), Wales region, was attached to the South-Western region ; whether he had any knowledge of the Welsh language ; and, if not, whether he would consider the appointing of an officer able to speak the language of the country in which he had to carry out his duties.—Major Tryon replied : The answer to the first part of the question is in the affirmative. I have no definite knowledge of this officer's acquaintance with the Welsh language, but as he has been performing his duties satisfactorily I assume that he has had no difficulty in understanding and making himself understood by pensioners in the Principality.

Dental Inspection in Wales.

Mr. Robert Jones asked the Minister of Pensions whether the deputy commissioner of medical services (dental) as part of his duties had to satisfy himself by personal examination as to the quality of the work done by each dentist : how many dentists were there on the dental panel for Wales ; how many dentures did the deputy commissioner of medical services (dental) examine in the 12 months ending March 31st, 1923 ; and in how many cases was the work unsatisfactory.—Major Tryon replied : The answer to the first part of the question is in the affirmative. Recent figures are not available, but during the year ended November, 1922, this officer examined personally 491 individual cases where dental treatment was provided, a considerable proportion of which had to be referred back for further treatment or for adjustment. There are about 60 dentists on the panel in Wales.

Panel Doctors and Treatment Allowances.

Mr. Robert Morrison asked the Minister of Pensions for what reason the Ministry refused to grant treatment allowances on the certificate of a man's panel doctor that the man was unable to work.—Major Tryon replied : Treatment allowances are payable only when a medical officer of the Ministry is satisfied that the nature of an approved course of treatment is such as to prevent the man from providing for his own support and that of his family. Full consideration is always given to any opinion expressed by the panel doctor on the requirements of any treatment approved.

Insane Prisoners.

Sir Robert Newman asked the Secretary of State for the Home Department whether he could state how many persons during the last four years had become insane and been certified as such while undergoing terms of imprisonment; whether any of them had died in that condition before being released from custody ; and how many convicted persons during the last four years had committed suicide while serving a sentence of imprisonment.—Mr. Bridgeman replied : The number of convicted, debtor, and surety prisoners certified insane in prison during the last four years is 432. None of these persons died while still in prison and before removal to an asylum. I have no information as to how many of these persons died before they were discharged from asylums. During the same four years 28 prisoners committed suicide in prison.

Nurses and Registration.

Dr. CHAPPLE asked the Minister of Health whether he could state the number of nurses who had applied for registration under the Nurses Registration Act, 1919, up to July 14th, 1923; and whether existing nurses would be eligible for registration if otherwise qualified, should their applications be received within a period of two years from the date on which the recent order came into operation.—Lord EUSTACE PERCY replied: I am informed that up to July 14th 40,436 applications had been received. After this date the council have no power to admit applications for registration as an existing nurse, and the reply to the second part of the question is, therefore, in the negative.

FRIDAY, JULY 20TH.

Small-pox at Brockworth Aerodrome.

Mr. RHYS DAVIES asked the Minister of Health whether any of the patients at the Brockworth aerodrome had actually died as a result of small-pox and, if so, what were their ages; whether they were vaccinated either before or after reaching the aerodrome; and how long had they been at the aerodrome.—Mr. NEVILLE CHAMBERLAIN replied: So far as I am aware, there have been three deaths among small-pox patients at the Brockworth aerodrome. The first was an unvaccinated man, 58 years of age, who died, five days after admission, as a result of cerebral hæmorrhage and delirium tremens whilst suffering from a mild attack of small-pox. The second was an unvaccinated child, 6 weeks of age, who died from small-pox seven days after admission to hospital. The third was an unvaccinated child, 10 months of age, whose death, 12 days after admission to hospital, was due to small-pox, complicated by enteritis and heart failure.

MONDAY, JULY 23RD.

Mortality from Small-pox.

Mr. LUNN asked the Minister of Health what was the annual mortality per 1,000,000 living from small-pox at ages under 15 years for the periods 1861–70, 1871–80, 1881–90, 1891–1900, 1901–10, and 1911–20.—Mr. NEVILLE CHAMBERLAIN replied: These particulars are only available for the usual age groups for ages under 15—viz., 0–5, 5–10, 10–15—shown in the table below:

	0–5	5–10	10–15
1861–70	638	145	56
1871–80	518	285	138
1881–90	80	33	26
1891–1900	29	10	3
1901–10	22	7	6
1911–20	0·57	0·32	0·11

Pernicious Anæmia.

Sir ROBERT NEWMAN asked the Minister of Health whether he possessed any statistics concerning deaths from a complaint known as pernicious anæmia; if so, whether he could state if the deaths arising from that complaint had considerably increased of late years; and whether a considerable number had occurred among ex-Service men.—Mr. NEVILLE CHAMBERLAIN replied: Separate figures in regard to pernicious anæmia are not available for years prior to 1920, but as the bulk of the deaths included under the heading anæmia are due to pernicious anæmia, the figures in the following table may be of use. Figures are not available for ex-Service men as a whole, but I am informed by the Ministry of Pensions that as regard ex-Service men pensioned for injuries or disabilities, 152 out of a total of 60,000 deaths were due to pernicious anæmia.

Death-rate per Million Living.

—	Anæmia.		Pernicious anæmia.		Other forms.	
	Males.	Females.	Males.	Females.	Males.	Females.
1911	48	60	—	—	—	—
1912	49	63	—	—	—	—
1913	54	65	—	—	—	—
1914	56	72	—	—	—	—
1915*	69	75	—	—	—	—
1916*	69	74	—	—	—	—
1917*	74	74	—	—	—	—
1918*	69	60	—	—	—	—
1919	57	71	—	—	—	—
1920	61	71	55	62	6	9
1921	62	84	55	74	7	10
1922	68		61	74	7	10

* The figures for the years 1915–1918 are based on the civilian population.

TUESDAY, JULY 24TH.

The Army Medical Service.

Mr. BECKER asked the Under-Secretary of State for Wa if, in view of the unpopularity of the Army Medical Servic at the present time, he would recommend that young medic men should be invited to serve three, five, or seven year with a gratuity at the end of service, so as to maintain steady flow of young men into the Service.—Lieut.-Colon GUINNESS replied: It is already open to army medic officers to retire with gratuity after eight and a half year service. I do not think the shortening of this period desirable, or administratively practicable, having regard, f instance, to the requirements of the army in India.

Small-pox at Gloucester Aerodrome.

Mr. LEACH asked the Minister of Health whether he woul arrange for photographs to be taken of half a dozen of th most representative cases of small-pox at the Gloucest aerodrome, so that medical officers could be made famili with the symptoms of the disease that was diagnosed a small-pox to-day.—Lord E. PERCY replied: I understan that photographs of some of these cases have already bee taken, but I am advised that a study of such photograph would not be of much assistance to medical men in th differentiation of symptoms of small-pox.

Appointments.

GIMBLETT, C. L., M.D. Camb., M.R.C.P. Lond., F.R.C.S. Eng has been appointed Hon. Ophthalmic Surgeon to the Roy Northern Hospital.

SOUTHAM, A. H., M.D., M.Ch. Oxon., F.R.C.S.Eng., Assistan Surgeon, Manchester Children's Hospital.

Vacancies.

For further information refer to the advertisement columns.

Bristol, Cossham Memorial Hospital, Kingswood.—H.S. £120.
Cardiff Royal Infirmary.—Two Hon. Dental Surgs.
Carmarthenshire Education Committee.—Chief School M.O. £70
Cumberland County Council.—Asst. County M.O.H. £500.
Devonport, Royal Albert Hospital.—H.S. £150.
Durham County Hospital.—H.S. £200.
Earlswood, Royal Earlswood Institution.—Med. Supt. £800.
East African Medical Service.—M.O. £600.
Exeter, Royal Devon and Exeter Hospital.—H.P. £150.
Exminster, Devon Mental Hospital.—Third Asst. M.O. £300.
Federated Malay States, Central Mental Hospital.—Asst. Me Supt. £616.
Finsbury Dispensary, Brewer-street, Goswell-road, E.C.—S. £5
Freemasons Hospital and Nursing Home, 237, Fulham-roa Chelsea, S.W.—Res. M.O. £250.
Hospital of St. John and St. Elizabeth, 40, Grove End-road, N.W —Radiologist. 50 guineas.
Inverness, Northern Infirmary.—H.S. £120.
Jamaica, Clarendon Parochial Board.—M.O.H. £600 to £800.
Leeds Public Dispensary.—Sen. Res. M.O. £200.
London Hospital, E.—First Asst. to each of the Surgical Firm £400.
Manchester, Baguley Sanatorium.—Third Asst. M.O. £400.
Manchester, Monsall Fever Hospital.—Jun. Med. Asst. £405 6.
Manchester, St. Mary's Hospitals for Women and Children.—Ass M.O. £100.
Mid-Wales Counties Mental Hospital, Talgarth, Breconshire.— Med. Supt. £800.
Prince of Wales's General Hospital, N.—Asst. M.O. in Venere Dept. £150.
Rotherham Hospital.—Sen. H.S. £260. Jun. H.S. £150.
Royal Free Hospital, Gray's Inn-road, W.C.—Sen. Res. M.O. £15
Royal Naval Medical Service.—Surgeon-Lieutenants.
St. Helens County Borough.—Asst. M.O.H. £500.
Salvation Army Mothers' Hospital, Clapton.—Sen. Res. Me Woman.
Swansea General and Eye Hospital.—Asst. Pathologist. £400.
West African Medical Service.—M.O. £660.
Windermere, Ethel Hedley Hospital for Crippled Children.—H.S £150.
Wrexham Borough.—M.O.H. £700.

Births, Marriages, and Deaths.

BIRTHS.

NEWHAM.—On July 17th, to Marjorie (née Auden), M.R.C.S. L.R.C.P., wife of W. B. Turner Newham, A.R.I.B.A., o Waterkloof, Pretoria—a son.

DEATHS.

MAJOR.—On July 15th, at a nursing home in London, Georg William Major, M.D., of Montreal, Canada.

WHITE.—On July 18th, at 7, Cliff-terrace, Margate, Edwar Alexander White, M.D., aged 70 years.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices o Births, Marriages, and Deaths.

Notes, Comments, and Abstracts.

TYPHUS FEVER EPIDEMIC AMONG THE GREEK REFUGEES.

BY SIR PATRICK HEHIR, K.C.I.E., C.B., C.M.G., M.D. BRUX., F.R.C.S., F.R.C.P. EDIN.,
MAJOR-GENERAL, I.M.S. (RET.): MEDICAL ADVISER, BRITISH RED CROSS SOCIETY IN GREECE.

(*Continued from p. 153.*)

The Municipal Hospital, Salonica.

THE remarks with which I terminated the first part of ay article do not apply to all refugee typhus hospitals; ome are decidedly superior. The best organised and worked nfectious diseases hospital I have come across in Greece is hat at Salonica under the local municipality. It is a hutted ospital arranged in groups of elongated wooden blocks vell lighted and ventilated. It can accommodate 500 atients; it had under treatment on May 14th 149 cases. hese included 86 typhus fever, 30 relapsing fever, 6 smallox, 23 erysipelas, 2 enteric, 1 paratyphoid A, 1 scarlet fever. he staff consists of 3 medical officers, 15 nurses, and 23 male ick attendants. The whole work of the hospital, which deals xclusively with refugees, is of as high a standard as can be xpected in connexion with the medical care of refugees. t was opened on Dec. 6th, 1922, and up to May 14th, 1923, ad admitted 275 cases of typhus fever, of whom 16 died, a nortality of 5·8 per cent., the lowest on record in Greece. f the staff 6 have been attacked, including the médecin en hef, 2 nurses, and 3 male sick attendants; all recovered. t is noteworthy that the infected nurses and sick attendants vere employed in the delousing department of the hospital nd not in the wards.

Period of Incubation.

Forty years or so ago 12 days used to be given as the eriod of incubation of typhus. All recent experience of the isease in Russia and Greece shows this to be still literally orrect. It has been proved by the inoculation of infective uman blood experimentally into man and monkeys.[1] It eems probable that the dose of the virus introduced into nan initially may affect not only the severity of the disease ut also the period of incubation. Medical officers in Greek ospitals treating typhus acquired by sick attendants, nurses, nd doctors hold this view, and we have some grounds for upporting it from the cases treated in our own refugee yphus ward in Athens. Kusama has shown that if monkeys eceive the minimum infective dose, the period of incubation vill be lengthened and the fever will be of shorter duration nd milder.

Clinical History.

Normally the onset is gradual. A generation or so ago a udden and violent beginning was laid down as one of he specific features distinguishing typhus from typhoid. There are the usual indications of a commencing pyrexia, uch as malaise, a tired feeling, headache, and anorexia. n a few days the face is somewhat flushed, conjunctiva njected, expression dull; tongue coated, lips and mouth dry; thirst, constipation, pain in the back and limbs re complained of; headache is severe. By the time the atient is brought to hospital (vide infra) there is, as a rule, o doubt about the diagnosis. By the fifth day the mucous nembranes are often implicated in the rash, the tongue is hickly coated with a white fur and it becomes dry; later t is cracked and fissured; the mouth becomes offensive nd sordes collect on the teeth, although these conditions an, to a certain extent, be prevented by careful nursing. Diarrhœa may set in at this time, and if intractable is an nfavourable symptom. On the other hand, as stated, onstipation may be present and tempt the physician to dminister aperients, the effects of which may be difficult o control.

The rash usually appears about the end of the fourth day, but at that time requires to be carefully looked for on the outside and front of the arms, on the chest, abdomen, houlders, back, and hips. It comes out as small ovoid or ound slightly raised pink or roseolar spots. On the fifth day the eruption is well marked, and among the red spots vill be found some maculæ which do not fade on pressure. After this petechial patches may be formed. On the eighth or ninth day the eruption is decidedly petechial and has a nultiform character—roseolar patches, red spots, maculæ or small petechiæ, and large plaques typically petechial. The eruption may vary, however, from faint pink roseolar spots to large ecchymosed patches. In a well-marked case by the sixth day the eruption cannot be mistaken for that of any other disease; it is well seen on the outer surface of the arms and forearms, shoulders, back and lower part of the abdomen, and on the hips. If the hands are affected the palms often escape, while the dorsal surface is covered with maculæ. In about 1 per cent. of the typhus cases seen in Greece there is either no eruption or only a faint roseolar one; this is more frequently the case in children and adolescents; in these the Weil-Felix reaction is present. By the end of the second week little is left of it. I was specially impressed by the absence of eruption [illegible] the face in cases where it almost covered the rest of the body. Nevertheless, there appeared to be a characteristic facies, with a reddish ring around the eyes about half an inch in diameter, and a similar but fainter ring round the mouth. These rings, with the injected conjunctiva, cracked lips and a dull, apathetic, semi-drunken expression, with much prostration, seemed to me to give the patient a very distinctive appearance. In some cases the general lousiness antecedent to the onset of the disease has led to considerable skin irritation with scratching and local secondary infections, which may initially be rather puzzling. In three large infectious diseases hospitals I visited several times the cases are as a rule admitted on the fifth day; the eruption is in the large majority of typhus cases already fairly developed.

Delirium.—Delirium, often noisy, is a common symptom about the end of the first week, but it soon acquires a low muttering character. Different phases of the mental state may be met with in a large ward of typhus cases. In a ward containing 30 patients which I visited one patient had just been retrieved after running out of hospital; another was attempting to run downstairs, two were shouting, in several there was a muttering delirium; some were dying, others were recovering consciousness, and so on. The whole picture was most melancholy.

Pulse and Temperature.—The pulse during the first week in uncomplicated cases runs from 85 to 100 per minute; it is losing tension. During the second week it is from 110 to 115. The comparatively slow pulse of 90 to 100 per minute with a high temperature is a normal phenomenon in moderately severe cases up to the beginning of the critical period, ninth to the fourteenth day, when it rises to 110 or even to 120–130. The temperature rises gradually, and by the end of the third day reaches 104° or 105° F. After reaching the maximum there is no great diurnal variation, the figure usually being a degree lower in the morning. The gradual rise is a useful guide to the diagnosis in the pre-eruptive stage, and differs from the regular "step-ladder" ascent of enteric. I came across several cases with temperatures between 103° and 106°, but none with real hyperpyrexia. A rapid fall of the temperature to the neighbourhood of 100°, in conjunction with the progressive rise in the pulse-rate, is an unfavourable sign. Increasing asthenia and muscular debility are always present; patients can scarcely move in bed; they are often unable to protrude the tongue, and lose all expression. Emaciation in some cases towards the end of the disease is most marked; to see a group of convalescents in most refugee typhus hospitals after moderately severe typhus, where proper feeding and massage have been neglected, reminds one of the cases of chronic starvation seen in famine camps in India. That it is not an inevitable consequence of the disease was seen in at least two hospitals, in one of which (Salonica) there was only one case of moderate emaciation among 32 convalescents. In a small proportion of cases there is a definite single crisis; in most cases there is lysis, but a mixture of these, beginning with a lysis and ending in a crisis, or the reverse, may take place. A true crisis is the most satisfactory termination, and leads to a fairly speedy convalescence; a definite and prolonged lysis is usually the forerunner of a long-continued convalescence.

In the above account of symptoms I have only given in general terms the ordinary course of moderately severe cases seen in the British Red Cross Hospitals and in Greek hospitals associated with our work. As with most other epidemic infectious diseases, cases vary considerably in severity. Some are so mild that the patients neither come to hospital nor take to their beds, and continue to move about as if nothing is the matter with them; the part such cases take in the epidemic need not be emphasised. Others brought to hospital at the end of the fifth day or later are so overwhelmed with the effects of the virus that they die in a day or to.

Diagnosis.

The general practitioner sometimes seems to find difficulty in accurately diagnosing some cases of typhus in the early stage. This is the experience of all the infectious diseases hospitals in Greece. I was informed by medical officers in charge of two large infectious diseases hospitals in and near the capital that about 8 per cent. of their cases are initially wrongly diagnosed, and that they continue to receive cases of influenza and relapsing fever, measles, and other diseases as typhus, while 3 per cent. of cases diagnosed as typhus turn out to be other diseases. Typhus is sometimes combined with other infectious diseases; I have seen three in which it ran concurrently with relapsing fever, proved by the coexistence of a typical typhus rash and *S. obermeieri* in the blood. Relapsing fever is the disease over which the greatest number of mistakes is made in all hospitals. In relapsing fever the *sudden* onset with rapid rise of temperature, severe headache, pains in the back and extremities, absence of dullness and apathy, and (ordinarily) of rash, the presence of a moist tongue, and of *S. obermeieri* in the blood, and, later in the disease, more or less anæmia, should be sufficiently distinctive. In the Salonica Hospital the records show that in eight cases typhus and relapsing fever ran their course concurrently in the same cases, and that so far as could be observed neither disease affected the course of the other; the only change noticed was that during a relapse the fever ran up a degree or so; nor did the cases assume a graver type, although the usual complications of typhus occurred. The use of neo-salvarsan for the recurrent fever did not affect the normal progress of the typhus. The combined infection seems to suggest that the same louse may be able to carry *S. obermeieri* and the virus of typhus and inoculate them at the same time. This is a point worth investigation. In many typhus and influenza ran together, the latter disease being also epidemic at the time. In one infectious diseases hospital, where they admitted several hundred cases of both small-pox and typhus, the medical officers told me that they had not met a single instance in which the two diseases occurred in patients at the same time, although in one typhus followed the small-pox, probably from infection acquired in the hospital.

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[1] Kusama: THE LANCET, 1921, ii., 386.

Weil-Felix Reaction.—This reaction in typhus is very distinctive. Its nature is described in all modern works on the disease. It owes its origin to the discovery of the fact that what are called the "X" strains of *B. proteus* are agglutinated by the serum of typhus cases. The special strains that do this are X 2 and X 19; these were primarily obtained from typhus urine. The reaction is similar to that of Widal in enteric; the macroscopic method is here usually adopted. The minimum dilution accepted as positive is 1 to 100. Practically, the serum of the vast majority of typhus fever cases after the eighth day is positive, whilst that of other fevers is negative. The *Journal of the Royal Army Medical Corps* for July, 1920, contains a clear account of this reaction and its technique. In three cases without eruption, diagnosed as typhus, the reaction proved positive; the subsequent course of the disease bore out the diagnosis. Several senior physicians of large hospitals in Greece assured me that they place implicit reliance on this test. It is certainly most useful in mild cases without eruption and in cases running an aberrant course.

The most reliable and complete records of the Weil-Felix reaction I have had the opportunity of reviewing are those of the Salonica Infectious Diseases Hospital. This reaction was employed from the date of opening the hospital, Dec. 6th, 1922, and includes the particulars of 275 cases of typhus. From the data collected I ascertained certain facts. The reaction is not present until the sixth day. Two nurses and three male sick attendants at the hospital were attacked. In each of these the patient was seen from the first day of the fever and the test applied daily; in none did it appear before the sixth day, and in all it appeared on the sixth day. Of the 86 cases in hospital on May 14th, 1923, the reaction appeared on the sixth day in 23; in others it appeared on the seventh, eighth, ninth, and tenth days; in two it was not present until the lysis started; in one it was first met with on the last day of the fever. In one of the 275 cases it did not occur at all, not even in 1–20 dilution; the case was characteristically typhus. In this series the reaction was absent in 0·36 per cent. of cases. A certain number of typhus cases give a positive Widal reaction in 1–20, but it remains stationary at that point, whereas the Weil-Felix test becomes more pronounced daily, usually reaching its acme at 1–800 on the twelfth to the fourteenth day.

Macroscopically the Weil-Felix presents much the same characters as the Widal in enteric, with the same variations in rapidity of clumping. When well marked, the scattered dead micro-organisms of *B. proteus* move like a living thing to form a striking mass in the typhus serum. In one of two cases of typhoid, and in one of paratyphoid A, I saw the Weil-Felix reaction well marked in 1–20; they had remained stationary at that for a week, whereas the specific Widal in each case was progressively rising. None of the relapsing fever cases gave the Weil-Felix reaction except when the disease was associated with typhus.

(*To be continued.*)

A DIRECTORY OF BART.'S MEN.

THE Year Book of the St. Bartholomew's Hospital Students' Union appears again after an interval of nearly ten years. The last edition was dated April, 1914. This useful "little red book" contains a brief account of the Students' Union and its various athletic and social clubs, with an alphabetical list of present students. It also contains a directory, both alphabetical and topographical, of Bart.'s men in practice, with a request that any errors or omissions should be notified to the editor of the Year Book. The cost of publication is chargeable to the Students' Union, and the Bart.'s men to whom it has individually been sent are asked to remit the modest sum of 1*s.* to help in defraying the expenses. Such hospital directories have a value in keeping present and past members of a great school in touch with one another.

A BOOK FOR LAYMEN ON HEART FAILURE.

A SERIES entitled "Harvard Health Talks" is designed "to provide modern and authoritative information on medical subjects," and a recent volume[1] in the series embodying the substance of some public lectures delivered at the Harvard Medical School admirably fulfils this object as regards heart failure. The writer is to be congratulated on having expressed so lucidly in such a small space the main facts of the present-day conception of this subject. A short sketch of the "arterio-sclerotic" and "rheumatic" forms of heart disease is followed by a reference to the importance of syphilis and other types of infection. Attention is called to the frequency with which the presence of a heart lesion is revealed accidentally in the course of a routine examination and the importance of preventive and remedial measures is discussed. There is a small mistake on p. 13, in reference to the coronary arteries, which requires correction. Lectures such as these will help to interest the public in the prevention of heart disease and so enlist their coöperation in the eradication of a cause of economic wastage which the writer holds to be even more important than tuberculosis.

---

[1] The Causes of Heart Failure. By William Henry Robey, Assistant Professor of Medicine in Harvard University; Visiting Physician to the Boston City Hospital. Cambridge: Harvard University Press. London: Humphrey Milford, Oxford University Press. 1922. Pp. 45. 4*s.* 6*d.*

Medical Diary.

Information to be included in this column should reach in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

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MONDAY, July 30th.—10 A.M., Mr. Maingot: Surgical Pathology. 2 P.M., Mr. Addison: Surgical Wards. 3 P.M., Mr. Simson: Diseases of Women.

TUESDAY.—11 A.M., Dr. McDougal: Electrical Dept. 12 noon, Dr. Burrell: Chest Cases. 2.30 P.M., Mr. Tyrrell Gray: Surgical Wards.

WEDNESDAY.—10 A.M., Dr. Saunders: Medical Diseases of Children. 11 A.M., Mr. Simson: Gynæcological Demonstration. 3 P.M., Dr. Pernet: Skin Dept.

THURSDAY.—10 A.M., Dr. Grainger Stewart: Neurological Dept. 2 P.M., Mr. MacDonald: Genito-Urinary Dept. 3 P.M., Dr. Scott-Pinchin: Medical Out-patients.

FRIDAY.—10 A.M., Mr. Dudley Buxton: Dental Dept. 3 P.M., Mr. Sinclair: Surgical Out-patients.

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THE LANCET

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CONTENTS

THE WHOLE OF THE LITERARY MATTER IN THE LANCET IS COPYRIGHT.

N ADDRESS entitled Should Infant Mortality be Reduced ? By Prof. FRED. E. WYNNE, M.B., B.Ch., D.P.H. 211
LECTURE on Problems of Acclimatisation. By ANDREW BALFOUR, C.B., C.M.G., M.D., F.R.C.P.. 243

ORIGINAL ARTICLES.

ısostomy for Seminal Vesiculitis, with a Description of a New and Improved Technique for the Operation. By FRANK KIDD, M.Ch., F.R.C.S.—(*Illustrated*) . 213
ırenchymatous Hypertrophy of the Breast. By DUNCAN C. L. FITZWILLIAMS, C.M.G., M.D., F.R.C.S.—(*Illustrated*).. 218
ıe Digestive Function in Pulmonary Tuberculosis. By J. GORDON HISLOP, M.B., Ch.B., M.R.C.P.—(*Illustrated*) 221
ʻaumatic Rupture of a Hydronephrosis. By H. W. L. MOLESWORTH, F.R.C.S. 224
ʻphus Fever Epidemic Among the Greek Refugees. By Sir PATRICK HEHIR, K.C.I.E., C.B., C.M.G., M.D., F.R.C.S. 264

MEDICAL SOCIETIES.

edical Society for Study of Venereal Diseases.... 225

EVIEWS AND NOTICES OF BOOKS.

ʻrebro-Spinal Fluid in Health and Disease. By A. Levinson, M.D. 226
ʻitfaden für die klinisch-bakteriologischen Kulturmethoden. Von Prof. Dr. Hugo Schottmüller. 226
ikromethodik: Quantitative Bestimmung der Harn- und Blutbestandteile in kleinen Mengen. Von Dr. L. Pincussen .. 226
ıe Anatomy of the Female Pelvis. By F. A. Maguire, M.B., F.R.C.S. 227
Manual of Human Anatomy for Dental Students. By R. Bramble Green, M.B., F.R.C.S.. 227
ırgical Nursing and After-Treatment. By H. C. Rutherford Darling, M.D., M.S., F.R.C.S. ... 227
ıe Nursing of Infectious Diseases. By F. J. Woollacott, M.D., D.P.H. 227
Text-book of Anatomy and Physiology. By Elizabeth R. Bundy, M.D. .. 227

NEW INVENTIONS.

New Pattern Oxygen Sight-Feed Valve (Dr. F. P. de Caux)—(*Illustrated*) 228
An Apparatus for the Administration of Nitrous Oxide, Oxygen, and Ether (Dr. I. W. Magill)—(*Illustrated*) 228

BRITISH MEDICAL ASSOCIATION.

Annual Meeting at Portsmouth.

Representative Meeting : Financial Statement.—Medical Benevolence.—Municipal Clinics and Hospitals.—Notification of Convictions to the G.M.C.—Non-panel Practitioners.—Notification of Venereal Disease 229
Annual General Meeting .. 232
Functions and Festivities.. 232
Exhibition of Instruments and Drugs 233

LEADING ARTICLES.

LOCAL HEALTH ADMINISTRATION 235
PRECIPITATION TESTS FOR SYPHILIS 235
PUBLICATIONS WHICH "TEND TO DEPRAVE" . 236
PHYSICAL TRAINING IN THE NAVY 236
THE LANCET CENTENARY DINNER 237

ANNOTATIONS.

Natural and Artificial Sun Cure in Tuberculosis of the Lungs 237
The Notification of Tuberculosis 238
Appendicitis Caused by the Ascaris Lumbricoides .. 238
A New Health Insurance Code 238
The Treatment of Varicose Veins : A New Operation 239
The Social Welfare of the Insane 239
Acetylene and Ethylene as Anæsthetics 240
Dangerous Drugs 240
The Treatment of Nervous Pollakiuria............ 240
Extrapleural Thoracoplasty in Pulmonary Tuberculosis 241
A Survey of Diseases of the Lungs and Pleuræ 241

INDEX NOTICE.

THE LANCET, Vol. I., 1923 263

MODERN TECHNIQUE IN TREATMENT.

XXXI.—The Treatment of Infantile Eczema. By H. MACCORMAC, C.B.E., M.D., F.R.C.P. 242

SPECIAL ARTICLES.

Associated Cardiac Clinics in U.S.A. 233
Medicine and the Law : Cocaine Traffic and Long Sentences.—A Bedridden Criminal.—Libel on a Medical Referee 247
Tuberculosis : Annual Report of King Edward VII. Sanatorium 248
United States of America : Industrial Hazards of Children.—Medicine in Industry 248
Notes from India : Working of District Municipalities in Madras Presidency 249
Congress of the Royal Sanitary Institute at Hull 251
Eleventh International Physiological Congress . 252

THE SERVICES.

Royal Naval Medical Service.—Territorial Army.—Indian Medical Service 251

PUBLIC HEALTH SERVICES.

The Health of London in 1922 253
School Medical Service ... 254
Mental Hospitals Service.. 255

CORRESPONDENCE.

The Tooth-Brush as a Carrier of Virulent Diphtheria Bacilli (Drs. G. H. Culverwell and J. Graham Forbes) 255
Royal Medical Benevolent Fund (Dr. Astley V. Clarke) 257
Ophthalmological Training for Medical Students (Mr. Percy Flemming).. 257
The Treatment of Habitual Constipation (Dr. Samuel R. Collier) 257
Medical Directory, 1924 .. 257

MEDICAL NEWS.

Royal College of Physicians of London 258
Royal Colleges of Physicians of London and Surgeons of England 258
Society of Apothecaries of London 259
Royal College of Surgeons of Edinburgh 259
Rotarian Pharmacists 213
Public Health Work in Czecho-Slovakia 223
Donations and Bequests . 234
Research on Parasites of the Cotton Plant 247
Liverpool Royal Infirmary: New Nurses' Home 257
People's League of Health 257
Small-pox in England and Wales 259
The Veterinary Profession and Public Health in Ireland 259
Metropolitan Asylums Board 259
Rockefeller Medical Fellowships 260
Association of Certificated Blind Masseurs 260
Irish Hospitals and Lotteries 260
The late Dr. W. A. Walker 260
Public Health in Soviet Russia 260
The late Dr. F. J. Knowles 260
Lancashire County Tuberculosis Committee 260
Memorial to the late Dr. Joshua J. Cox 260

PARLIAMENTARY INTELLIGENCE.

House of Lords: Therapeutic Substances Bill.—Smoke Abatement Bill.—National Health Consolidation 260
House of Commons: Children Employed in Mines.—Pensioners and Tuberculosis.—Powers of Medical Officers of Health.—Health Insurance Contributions. — Cancer Areas. — Birth Control Information.—Poor-law Authorities and Small-pox.—Deaths from Starvation. — Cost of Insulin.—Salford Public Vaccinator and the Regulations. — Deaths from Small-pox. — Court of Appeal for Lunatics.—Nurses' Registration Rules. — Maternity Benefit 260

NOTES, COMMENTS, AND ABSTRACTS.

Prevention of Decay of Teeth 265
Terebene Toilet Soap..... 266
Queen Mary's Convalescent Auxiliary Hospitals 266
Public Health in South Africa 266
Appointments.—Vacancies 263
Births, Marriages, Deaths. 263
Medical Diary 263

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An Address

ENTITLED

SHOULD INFANT MORTALITY BE REDUCED?

Delivered before the Section of Maternity and Child Welfare of the Congress of the Sanitary Institute at Hull, August 2nd, 1923.

By FRED. E. WYNNE, M.B., B.Ch. Dub., D.P.H.,
MEDICAL OFFICER OF HEALTH, SHEFFIELD; PROFESSOR OF PUBLIC HEALTH, SHEFFIELD UNIVERSITY.

I AM aware that to ask the question contained in my title will be regarded in some quarters as akin to blasphemy, but we have to face the fact that the question has been asked, will be asked again, and has been answered in the negative on very high authority. Those of us who are responsible for the saving of infant life and the prevention of infant suffering must, therefore, know what are the arguments brought against this work. The unparalleled fall in infant mortality during the last 20 years must be attributed very largely to improved sanitation generally, and especially to the intensive campaign of baby culture carried out by child welfare organisations throughout the country; as we have claimed the credit, so we must accept the responsibility for this state of affairs.

Speaking very briefly and generally, the objections to this reduction of mortality are two, viz.: (1) that it is interfering with the proper balance of births and deaths, and by increasing the rate of natural increase is adding to the difficulties of a nation already over-populated; (2) that infant mortality is selective in ts action, and that its reduction involves an undue survival of hereditary undesirables, thereby progressively deteriorating the race.

The Limits of Population.

To take the first and simpler argument first, there must obviously be a limit to population, and as population increases the rate of increase must be reduced; otherwise the annual increment would in time reach ntolerable proportions. We have in parts of China and India and other eastern countries instances of communities which have reached and passed the limit of population, where whole races live in a condition bordering on starvation, and infanticide is the recognised practice, until famine and flood cut short the sufferings of the human swarm. Among these people he instinct of race preservation absolutely demands female infanticide, and it is interesting to note that, as always happens, this instinct is interpreted in terms f religion. The Chinaman must have a son, otherwise not only his own soul but those of his whole line of ncestors are condemned to eternal perdition. He herefore kills off female infants in order to make room for the hoped-for male. Until that son is born he will o on begetting children.

We are still far from these horrors which are inevitable when population overtakes the limits of the means f subsistence; but even in this country we have eached one of those crises foreseen by Malthus, when, n spite of all our industrial development and consequent power of importing food, our population question s already becoming acute; when it is at least rendering mpossible the improved standard of living now niversally demanded; and when, as many believe, he pressure of population is the real cause of all our ocial troubles, including war. This danger would be o real as to constitute a serious argument against a urther reduction of the death-rate were it not that t is largely counterbalanced by a decline in the birth-ate.

The average birth-rate in England and Wales in he 10 years 1871 to 1880 was 35·4, and in the five ears 1911 to 1915 it was 23·6. During the same periods he general death-rate was 21·4 and 14·3, while the nfant mortality rate fell from 149 to 110. In 1922 the birth-rate in England and Wales was 20·6, the general death-rate 12·9, and the infant mortality rate 77. This fall in the birth-rate, however, is not yet sufficient wholly to compensate the two factors of lowered death-rate and increased population, so that the actual increment is as yet no less year by year. In fact the survival rate in England and Wales actually increased from 12 in 1910 to 13 in 1920. This has not, however, been our experience in Sheffield, where the infant mortality has fallen from 202 in 1901 to 82 in 1922. Notwithstanding this, the actual excess of births over deaths has fallen from 6874 in 1902 to 4707 in 1922, a decrease in natural increase of 2167, or 32 per cent. This is consequent on a decline in the birth-rate during the same period from 33·3 to 20·7, which has not been fully compensated by a decline in the general death-rate from 16·9 to 11·7.

We therefore feel that as far as the population question is concerned in Sheffield we can continue our child welfare work with an easy conscience. The law which correlates birth-rates and death-rates, though very imperfectly understood, is so universal and so well known that there is no need to quote examples of it. It seems always, however, to be assumed that the lowered death-rate is consequent on the decreased birth-rate. No doubt this is to some extent true. The mother of a few children is not physically exhausted like the mother of 12, and the individuals composing a small family naturally come in for a larger share of parental solicitude than the members of a large one. But although it cannot be proved in figures I am convinced that the reverse is also true, that when children are born and allowed to die off like flies, there will always be a tendency to the reckless begetting of more; whereas when children are born into an environment in which they can survive, their influence makes for an increased sense of parental responsibility in both father and mother and a consequent restraint which must have a marked influence on the birth-rate.

Survival of Undesirables.

We must now consider the second and more serious charge, that by preserving the lives of the hereditary degenerate and unfit we are causing a deterioration of the mental and physical standard of the race. If I could be convinced of this, I should unhesitatingly advise the closure of every child welfare centre in the country, for I hold that we have no right to allow public health policy to be dictated by our natural feelings of human sympathy for the individual. Really to permit or encourage any process that would lead to a marked degeneration of the race would, in the long run, lead to suffering on a far vaster scale even than that which we now attempt to alleviate. I have accordingly felt it necessary to examine rather closely the evidence on which these charges are based.

Prof. Karl Pearson and others of his school have been at great pains to produce mathematical demonstrations of the fact that longevity is an hereditary and transmissible quality. In this they have fully succeeded, though I do not suppose the fact was ever in dispute. But they proceed to certain deductions based on a somewhat elaborate calculus which is applied to data of admittedly doubtful accuracy. The first of these conclusions is, according to Prof. Raymond Pearl,[1] "that from 50 to 75 per cent. of the general death-rate of the population on which the calculations are based is determined fundamentally by factors of heredity and is not capable of essential modification or amelioration by any sort of environmental action, however well intentioned, however costly, or however well advertised." If this be so, it is simply amazing that death-rates have responded as they have done to environmental changes, for it cannot be suggested that any hereditary factors have been at work to reduce the death-rate from 21 to 12 in 50 years. I am reminded of Bishop Butler's comment on the doctrine of necessity or determinism: "this doctrine, if true, is as though it were not true." A necessary corollary of this theory is that the death-rate, and more especially, of course, the infant death-rate, is selective in its action. Here, indeed, is the gravamen of the charge, for if this be so to the extent claimed, by trying to lessen infant mortality we are simply placing ourselves in the position of one who should cease weeding his garden and allow all his best plants to be choked by weeds. This view is developed especially by Dr. E. C. Snow in his "Studies in National Deterioration."[2]

---

[1] Biology of Death, Prof. Raymond Pearl. Lippincott, 1922.

The statistical studies in the heredity of longevity had been based on data obtained from the records of Royal families, from Burke's Peerage and Landed Gentry, and from the history of Quaker families, obviously exceptional sections of the population. Snow set himself the far more difficult task of applying similar statistical methods to the general population, for which purpose he took as his data the populations of English and Prussian rural districts. He found a high degree of negative correlation between the death-rate in the first year of life and that in later periods up to 8 years.

On these results Snow bases the following conclusions: "We assert with great confidence that a high mortality in infancy is followed by a corresponding low mortality in childhood, and conversely. The migratory tendencies in urban districts militate against the deletion of selective influences there, but we express the belief that those influences are just as prevalent in industrial as in rural communities, and could be measured by other means if the data were forthcoming. Our work has led us to the conclusion that infant mortality does effect a weeding out of the unfit; but though we would give this conclusion all due emphasis we do not wish to assert that any effort, however small, to the end of reducing this mortality is undesirable."

Personally I find some difficulty in understanding why the data acquired by Snow cannot be obtained as well for urban and industrial populations as for rural ones, and if I shared his conviction I should certainly say that efforts to encourage these weeds were most undesirable. Quite apart from the findings of mathematicians I presume no one would deny that infant mortality is to a great extent selective, and especially so where the environment is undesirable. Congenitally weak babies, of course, are more likely to die from any given cause than strong ones. To my mind the whole question hinges on this: by reducing infant mortality are we merely postponing the deaths of weakly infants, thereby prolonging their sufferings and increasing the burden of those responsible for them, or are we doing something to provide an environment in which potentially good citizens have a reasonable chance of surviving and reproducing?

Sheffield Child Welfare Figures.

In order to answer this question as far as Sheffield is concerned, I have examined the records of 100 deaths of infants who had been under the care of our child welfare centre, and of whose home conditions and heredity we accordingly had some knowledge. These were all deaths occurring in the same year, but were otherwise taken quite at random, and are therefore typical of infant mortality as it affects our city. Of these deaths I have taken three groups as having probably different correlations with hereditary and environmental conditions. The groups are: (1) prematurity, convulsions, marasmus, &c., which are presumably closely dependent on heredity; (2) respiratory diseases, which I should expect to have the lowest correlation with either heredity or unsatisfactory environment; and (3) diarrhœal diseases, in which I should expect the correlation to be intermediate between the other two.

Of these 100 deaths I find that 23 are due to prematurity and definitely congenital conditions; 39 to respiratory diseases, and 24 to diarrhœal diseases, the balance of 14 being due to other causes. In order to test whether my preconceived ideas as to the probable correlation of deaths from these causes with hereditary and environmental conditions was correct, I have taken the employment of the father and the home conditions as indices of heredity and environment. As everyone knows, there are, unfortunatel immense numbers of men at present out of work through no fault of their own, especially in Sheffield but it seems a reasonable assumption that any man who has continued in skilled employment during such times as the present must be of a superior and intelligent type.

I have therefore divided the deaths between tw classes as regards heredity—children of men in skille employment and those of men out of work, engage in relief work or unskilled labour. As regard environment I have made three classes according t the description of the home conditions—as good, fair or slum. Table I. gives the percentages of death in each of these classes:—

TABLE I.

	Percentages.				
	Father.		Home conditions.		
	Class 1.	Class 2.	Good.	Fair.	Slum.
Congenital causes (23 deaths)	52·2	47·9	26·1	34·7	39·0
Respiratory diseases (39 deaths)	71·8	28·2	27·8	50·4	21·8
Diarrhœal diseases (24 deaths)	58·5	41·5	29·0	58·0	13·0

It will be seen that the presumed correlation work out fairly closely, the percentage of second-clas parentage among children dying of congenital cause being very much greater than in children dying o respiratory disease, and considerably greater than i children dying of diarrhœal diseases. The percentag of slum conditions is also much greater among th congenital deaths, doubtless because slum condition are very largely an index of parental degeneracy The percentage of slum conditions among infant dying of diarrhœal diseases is surprisingly low, bu this is accounted for by the fact that breast-feedin in Sheffield is the rule among the poorest classes, an the incidence of diarrhœa is therefore slightly highe in the class just above the lowest. The figures ar of course, small, but as far as they go I think th results show a definite correlation as expected betwee heredity, environment, and deaths from these thre groups of diseases.

The next step in my inquiry was to compare th mortality from these three groups of diseases in year of very high mortality, when infant welfare wor had scarcely begun, with a year of very low mortality when this work had been very highly organised for considerable period. Table II. gives this compariso for the years 1901 and 1922.

TABLE II.—*Infantile Mortality (City of Sheffield) fro all Causes and from Specified Causes groupe Years 1901 and 1922.*

—	1901.		1922.		Per-centag fall in mortali rate.
	No. of deaths.	Mortality per 1000 births.	No. of deaths.	Mortality per 1000 births.	
Prematurity ..	300	79 (39 %)	226	37 (45 %)	53
Debility Marasmus	335		88		
Congenital malformations	83		39		
Convulsions ..	292		50		
	1010		403		
Diarrhœal diseases	706	55 (27 %)	65	6 (7 %)	89
Pneumonia ..	160	26 (13 %)	114	22 (27 %)	15
Bronchitis ..	169		119		
	329		233		
All causes ..	2573	202*	884	82	59

* The infantile mortality rate for 1901 (202) was the highe recorded since the year 1871.

Note.—The first woman inspector was appointed in 1899.

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[2] Drapers' Company Research Mem., vii., 1911.

From this it will be seen that the percentage of total mortality due to congenital causes has reased from 39 to 45; the percentage due to piratory disease has increased from 13 to 27, while it due to diarrhœal diseases has fallen from 27 to 7. is quite evident from these figures, and the greatly luced birth-rate already referred to, that the luction of the Sheffield infant mortality is mainly e not to the saving of the congenitally unfit, but the virtual elimination of infantile diarrhœa, ich has comparatively little to do with congenital nditions.

The next point to be considered is how far the gative correlation between infant mortality and ld mortality shown by Snow's figures exists in effield? Table III. shows the infant mortality e, the mortality rate per 1000 births in the age riod 1 to 5, and the general death-rate for various ars between 1897 and 1922.

BLE III.—*Infant Mortality Rate (City of Sheffield); Mortality Rate per 1000 Births amongst Children over 1 and under 5 years of age; and General Death-rate.*

ear.	Infant mortality rate.	Mortality rate per 1000 births ages 1–5 years.	General death-rate.
897	196	94	21·2
902	150	62	16·9
907	145	87	17·1
912	107	60	14·3
917	104	61	14·6
921	99	41	12·5
922	82 = 41·9 %	44 = 46·8 %	11·7 = 55·2 %

From this it will be seen that while the infant rtality rate in 1922 is only 41·9 per cent. of the e in 1897, the death-rate from 1 to 5 (calculated 1000 births) has also fallen to 46·8 per cent. of at it was. These considerations appear to me to far to justify our work as far as Sheffield is conned, but I realise that the figures quoted are too all to serve as a basis for general statistical consions. My hope is that the problem may be acked on somewhat similar lines by persons better ed than myself to deal statistically with more ensive data.

At the same time I am entirely in agreement with eugenic school that the heredity of all children ning under our care should as far as possible be idied. It is not practicable to refuse aid and nfort to the innocent victims of caro-genic unions, t it should be an essential part of child welfare rk to seek for means of preventing such unions. m also convinced of the seriousness of the population problem, of what Prof. Pearl has well described "the impending saturation with human population of the portion of the earth's surface habitable by n."

But for the reasons given above I think it not possible that a reduced rate of infant mortality y itself prove a factor in bringing about a desirable luction in the birth-rate. I am convinced that in y case it is time that the thoughtless sentimental paganda in favour of the unlimited production of bies, and their preservation whether fit or unfit to vive, should be sternly discouraged by all who e public health work seriously.

ROTARIAN PHARMACISTS.—A meeting of Rotarian rmacists was held at the Hotel Great Central, London, July 25th, Dr. Thomas Stephenson, of Edinburgh, in chair, and the meeting was representative of all parts the country. The chairman opened a brief discussion Rotarianism as applied to pharmacy, pointing out the essity of the promotion of friendly relations between allied professions of medicine, dentistry, veterinary gery, and chemistry. He further pointed out that the erning principle of Rotary—namely, service to the comnity—should be the basis of all work in pharmacy; if principle were applied to many controversial questions vould be found that these questions were capable of easy ation.

VASOSTOMY FOR SEMINAL VESICULITIS,[1]

WITH A DESCRIPTION OF A NEW AND IMPROVED TECHNIQUE FOR THE OPERATION.

By FRANK KIDD, M.Ch. Camb., F.R.C.S. Eng.,
LATE SURGEON TO THE LONDON HOSPITAL.

FOR many years it has been realised by those who are called upon to deal with a large number of cases of gonococcal urethritis occurring in the male that there is a certain type of case which will baffle all the ordinary methods of treatment. The majority of cases of chronic gonorrhœa in the male get well in the course of from four to six months' treatment if irrigations or instillations accompanied by prostatic massage are employed. Many cases also need dilatation of soft strictures with bougies and Kollmann's dilators, and some require urethroscopic destruction of infected follicles in the anterior urethra. In any large series of consecutive cases 99 out of every 100 can be cured in a reasonable time by such treatment. There will remain uncured a type of case which I call a "bugbear" case, and which may be described as follows. The history will be that the man has had constant relapsing attacks of gonococcal urethritis over several years. These attacks come on the day after going with a woman. Often adequate precautions have been taken against infection, yet urethritis at once occurs. Or the attacks may come on apparently spontaneously after an excessive drinking bout or after hunting or bicycling. The man often knows that he has not been really cured, and that he harbours lurking gonococci shut up somewhere or other. Between the attacks, when he appears to be free of urethritis, he may suffer from attacks of increased frequency of micturition accompanied by hazy urine and pain or discomfort felt in the perineum or beneath the last inch of the penis, or even in the abdomen, loins, or thighs. These attacks may be attended by fever and be ushered in with a rigor. Some of these patients develop a swelling of one epididymis every time they get an attack, a swelling which comes on at the same time as the urethral discharge, a feature which distinguishes the illness from an ordinary case of reinfection. A few of them complain of hæmaturia, usually a few drops of blood squeezed out at the end of micturition. Others complain of hæmatospermia, or in other words they notice after a nocturnal emission that their pyjamas are stained with blood. Many of these men suffer from severe neurasthenia, often accompanied by impotence or sterility.

Features Associated with Stubborn Cases.

On examination it is found that in the majority of such cases the urine passed is not clear, but shows a dull thin haze of pus of a peculiar and characteristic appearance diagnostic to the trained eye of vesiculitis. But the feature above all others which characterises these "bugbear" or stubborn relapsing cases is that examination of the rectum reveals a prominent, thickened, tender, swollen seminal vesicle on one or both sides. If the testicle has been swollen on one side, the swollen vesicle will usually be on the same side. Attempts to massage the vesicle with the prostate simply lead to the obtaining of a bead of prostatic fluid which is only mildly purulent. If both vesicles are blocked no spermatozoa and no large mucinous shadows characteristic of vesicular secretion will be seen under the microscope. After the massage the vesicle or vesicles feel just as full as before. In other words, the contents of the vesicle are shut off from the deep urethra, the mouth of the duct being blocked with inspissated secretion or by fibrous stricture. It is in such a closed vesicle that the gonococcus (or the colon bacillus or streptococcus) can live imprisoned for years, and from time to time spring to life under the influence of alcohol or excessive venery or after a blow on the perineum. It then sets up an abscess which bursts into the deep urethra through a fortuitous opening which the pus digests for itself, and so leads to relapsing attacks of urethritis.

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[1] A paper read at the annual general meeting of the Medical Society for the Study of Venereal Diseases, July 20th, 1923.

In exceptional cases most of these features are absent. The man lives for years happily married without a suspicion that anything is amiss, his wife remaining free from infection. His urine is clear and he has no symptoms. Suddenly one day after a drinking bout he develops an arthritis or an iritis, and a few days or even a few weeks later profuse yellow urethral discharge makes it appearance, containing abundant gonococci. In these cases can always be felt by rectal examination a large, hard, thickened seminal vesicle from which pus and gonococci can be expressed by massage. In the case of one doctor I have evidence that the gonococcus had lived thus imprisoned for 25 years. In another doctor it had lived for 13 years. In another case it had thus lived for 41 years and set up attacks of arthritis and iritis. In other words, when faced with a case of unexplained arthritis or iritis, do not rest content until you can exclude the possibility of a closed infected vesicle. Also, in cases of chronic relapsing fever you may find the cause in a closed vesicle infected with the colon bacillus. Case 7 had been treated for fever in the tropics for nine years without any success until I proved he had a chronic infection of one vesicle with the colon bacillus and cured him by vasostomy. There were two other similar cases in this series.

In the ordinary case of posterior urethritis, with or without epididymitis, one or both vesicles usually become infected. These react to, and recover under, prostatic (and vesicular) massage because the duct is not blocked and because massage gradually brings away purulent infected vesicular secretion, often in the form of purulent casts of the vesicle.

It became clear, then, that there were certain "bugbear" cases of chronic relapsing gonorrhœa (and also of chronic relapsing colon bacillus or streptococcus infection) which could not be cured by any measures which did not get at the closed focus in the vesicle and eradicate it. Fuller and his pupils in America taught that in these cases an incision should be made in the perineum, through which the vesicles should either be drained or else completely removed. This operation can be carried out by the technique devised and improved by Fuller, Alexander, Young, and others, but it is an operation of considerable technical difficulty. Unless an operator can obtain a long apprenticeship in this operation he is bound to have a number of unpleasant complications, such as urinary and recto-urethral fistula and urinary incontinence. It occurred to other urologists to try and catheterise the ejaculatory ducts through a posterior urethroscope and so wash out the vesicles. This has undoubtedly been effected in a certain number of cases, notably by Luys and Hugh Young. Nevertheless it is not possible to catheterise these ducts except in a few cases. In most cases failure is met with. In not a few the cannula is pushed into the perivesical tissues, abscesses are produced, and other unpleasant consequences follow. The procedure is also very painful for the patient.

Belfield's Operation.

It occurred to Belfield, of Chicago, to try and get at the vesicles from the other end. He published his first paper in 1905,[2] and since then has published many papers dealing with the subject. He proposed to cut down on the vas deferens in the groin or scrotum, free it, puncture it with a hollow needle, and inject medicating fluid into the vas, ampulla, and vesicle. Using silver salts he showed by X ray photographs that by such a procedure it was possible to fill the ampulla of the vas and also the vesicle completely with antiseptic fluid. He pointed out that the vesicle is really a simple sac, lined by a few layers of columnar epithelium. That it possesses no lacunæ or cryptic recesses such as characterise the anterior urethra. That the fibrous bands which break up its intern lumen are simple structures which seldom interfe in any way with the complete filling of the vesicle wit fluid. The fluid when injected into the vas meets wit the sphincter muscle which surrounds the mouth of t ejaculatory duct. It then regurgitates backwar up into the lumen of the vesicle and fills it complete If, as is often the case in stubborn cases, the vesicle filled with a cast of inspissated secretion, collargol colloid silver softens and disintegrates this cast, an enables it thereby to be passed out of the vesic during the course of a nocturnal emission. To Belfie belongs, then, the great credit of having establishe a new and effective principle in the treatment of the "bugbear" cases, and in the course of years he h improved the technique and enlarged the scope for t operation. I would point out what a deep de urologists owe to Belfield for originating this new an vital principle. Not only does Belfield employ t operation for chronic resistant cases, but he now mak use of it in cases of recent acute vesiculitis accom panied by arthritis with marked success. Neve theless I find that even with his improved techni the operation is not always an easy one, nor is always possible to make sure of giving three was outs in the course of a week. As I hope to sho unless one can ensure three wash-outs in a week, o cannot hope to cure more than 80 per cent. of case For that reason I have worked at improving t technique, and I now describe a new type of operatio whereby it is nearly always possible to obtain successf results. This is the object of my communicatio to-night. The operation is not easy, and I warn tho who embark on it to read very carefully the minu details of technique described below.

The Improved Operation.

I shall first describe very briefly the history of t operation of vasostomy. Belfield tried cutting on t vas and washing out from above (vaso-puncture He soon found that more than one wash was needed t effect unfailing cures, at the most two or three. H therefore tried slinging up the vas with a strip rubber sheeting, dropping it back into the wound an fishing it up again every other day and re-puncturing i This is the technique originally demonstrated to m at the London Hospital in 1914 by his pupil, Dr. R. Herbst of Chicago, and which I employed for som years. The rubber may cause sloughing of the va so I gave it up. I next tried his improved metho In this, after exposing the vas, he punctures it with No. 23 gauge hollow needle, runs the needle along t canal for an inch, and then brings it out through v and skin. He threads a strand of silkworm gut throug the needle, removes the needle, and so has the v slung to the skin with a strand of gut. He uses th strand as a guide for inserting the needle. I found th the solution used for lavage leaked around the punctu and irritated the tissues, so I gave this method u Gradually and step by step I devised my prese technique which I now describe, and it is as ne perfect as I can at present make it. Neverthele difficulties may still arise, and it is not easy to ensu that three washes shall be given in the course of six seven days.

Technique.

The parts are shaved and the skin is disinfected wit iodine. The operation can be done under loc anæsthesia; nevertheless I usually employ a gener anæsthetic (open ether), as I prefer to keep the patien in bed for five or six days. Pinch up the skin at th top of the scrotum on its outer side where the dart muscle is absent, isolate the vas from the othe structures of the cord, and hold it firmly in positio with the fingers of the left hand immediately under th skin. Make an incision one inch long directly down t the vas till its white wall is clearly visible. Seize th vas with a pair of tenaculum gland forceps, and wit a few strokes of the knife, free it from its loose oute coating of areolar tissue, until the handle of a scalp can be pushed beneath it. The vas now lies sprea out and stretched upon the handle of the knife. Not

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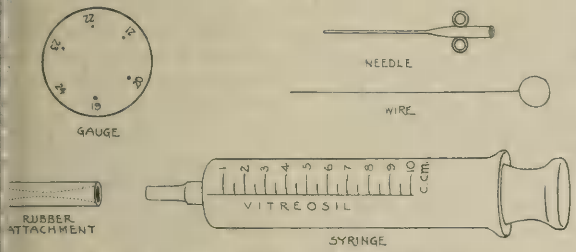
[2] Jour. of the Amer. Med. Assoc., April 2nd, 1905.

at the vas must be stripped quite bare of all connec-
ve tissue before opening it, and take care not to cut
e artery to the vas which runs along its posterior
all. With a fine sharp-pointed tenotome make a
y incision into the lumen of the vas large enough to
mit a hollow hypodermic needle. Having opened
to its lumen insert a piece of silkworm gut and run
down for some 10 inches to make certain that the
men has been entered freely and that the vas itself is
t blocked. Remove the silkworm gut, remove the
ife handle, and sling up the vas with a piece of
iled tape. Insert a special cannula[3] (see Fig. 1)

Fig. 1.



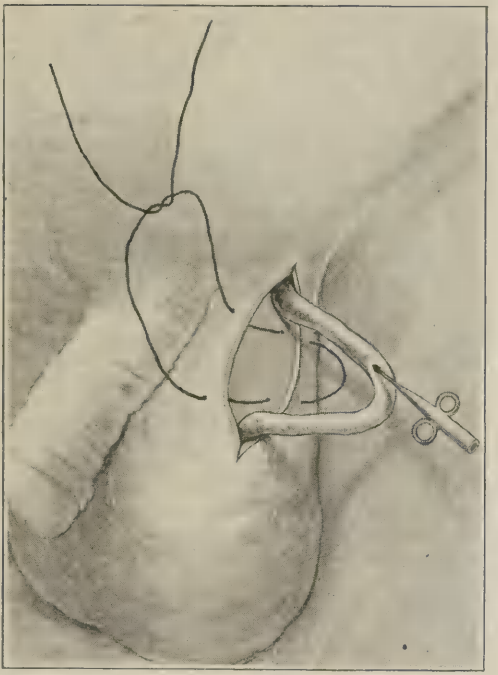
Syringe, attachment, gauge, needle, and wire.

uge 19–23 according to the size of the vas. It is of
e utmost importance not to use too large a cannula.
too large a cannula is inserted it will strip up the
ing membrane of the vas and stultify the operation.
to the nose of the cannula fit a special rubber tip as
signed and used for renal lavage (described by me in
22[4]), and to this attach a vitreosil syringe containing
few c.cm. of sterilised warm water. Using counter
essure with the tape, gently press the piston of the
ringe till the water is found to run easily into the
s. Now pack a little gauze beneath the vas to
event colloid silver from falling on to the tissues.
or some reason or other colloid silver causes no
itation to mucous membranes, but it causes great
itation and inflammation if allowed to fall on to or
ak into connective tissue. Fill the syringe with
c.cm. of 5 per cent. colloid silver. Reattach it
the rubber nozzle, and, using counter pressure with
e tape under the vas, gently press home the piston.
he colloid silver will be found gradually to disappear
to the vas and enter the vesicle. If 10 c.cm. are
ken quite easily squirt in another 10 c.cm., and if
is is taken easily even another 10 c.cm., till 30 c.cm.
e taken. The larger the quantity of fluid used up
30 c.cm. the better, if the vesicle is found willing
take it. If not, be content with 10 or 20 c.cm.

Remove the syringe and rubber cap and insert a
ire down the cannula to keep it from getting blocked.
ow comes the most important step in the operation.
sert a fine silkworm gut suture mattress-wise right
rough both sides of the skin and fascial incision and
neath the vas. Return it and pass it back again
lf an inch below through both layers of the skin
d fascia likewise beneath the vas (see Fig. 2). Tie
is suture, and thereby leave the vas slung up on a
d of connective tissue securely anchored at the level
the skin. Now fix each of the two rings provided
the cannula by means of a fine silkworm gut suture
the skin on each side. You now have the vas
atly slung up just beneath the skin and a cannula
curely fitted in place ready for the next wash-out.
spray the little wound with a few drops of my
alachite-green ethyl chloride spray to prevent wound
psis and cover it with a sling of gauze which slings up
so the testicles, cover with a T-bandage, and thread
piece of mackintosh over the penis to prevent soiling with urine. The patient's legs are bandaged together till he has come round from the anæsthetic. If both vesicles need lavage the operation is repeated on the opposite side. Sometimes the colloid silver is passed in the next few acts of micturition; sometimes it is not passed for several days. Belfield has record of a case where it was retained as long as 51 days without coming through. Sometimes it is passed as a black nocturnal emission a few days after the operation. In any case the vesicle can be felt by rectal examination to be distended with the wash, and its presence in the vesicle can be demonstrated by radiograms.

On the second day the wire guide is removed from the cannula, the syringe and rubber nozzle refitted, and a few drops of sterile water injected. If the injection runs freely, 10 c.cm. of colloid silver, 5 per cent., are then injected afresh. If the cannula is blocked and cannot be unblocked by means of the wire or by the injection of water, do not force colloid silver into the cannula. If you do so it will only leak backwards into the tissues and cause a painful nodule to develop.

Fig. 2.



Showing vas with cannula inserted and mattress suture passed and about to be tied so as to sling the vas just below the level of the skin edges.

In case of failure to get a second wash through, desist and take out the cannula. Usually a second wash goes through quite satisfactorily, the wire guide is reinserted, and a third wash is given on the fourth or fifth day, after which the cannula is removed. *When removing the cannula take out the silkworm gut slinging stitch and with the fingers manipulate the wound so as to loosen the adhesions round the vas and make it drop back into its proper position deeply in the scrotum.* This is a most important step. Unless this is done the vas may remain adherent to the skin wound and the opening persist as a spermatic fistula.

Results Obtained.

I shall now detail the results I have been able to obtain in 25 consecutive cases of vasostomy and the lessons I have learnt from them. Hitherto I have reserved the operation solely for "bugbear" cases, so that I have not had many cases for which the operation was necessary. I shall hope to obtain an increasing number of cases if I can persuade the profession that the operation is well worth while for fresh acute cases of vesiculitis with arthritis. I have notes of 25 cases operated on since 1914. All had long-persisting vesiculitis except one (Case 22), who had fairly recent joint trouble. In 21 cases the infecting organism was the gonococcus, in three the colon bacillus, in one a streptococcus, and in one of the colon bacillus cases a streptococcus as well.

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[3] These cannulæ are specially made for me by J. H. Montague,
69, New Bond-street, and also the gauge for measuring their
es. They are constructed so that a guide wire will pass
sily either way, in contrast to the usual hypodermic needle
ere a wire will only pass one way owing to the method of
nstruction. This is a very important point. They can also
pply the syringe and special rubber nozzles (see Fig. 1).
lloid silver in strengths of 5 and 10 per cent. is specially made
r me by Crookes Collosols, 22, Chenies-street, London, W.C.

[4] Brit. Med. Jour., 1922, i., 748.

The operation is one of great importance to married men in difficulties, or to men shortly about to marry and who are pressed for time as regards cure. Seven were already married. One had been married many years, yet his infection dated back to 1878, and he had relapses of iritis and arthritis in 1922 as a result. His wife had joint trouble too. One (Case 22) was married, had acute arthritis, and wanted to get back quickly to his wife. His joints were cured, and he went back to his wife in five weeks after the operation. One (Case 19) had a *B. coli* infection and never infected his wife. One (Case 17) had been abroad, where he became infected with the gonococcus. He returned to England early in 1920 and had to lie to his wife, yet refused vasostomy until the end of 1920, when he submitted to it. Within 21 days of his operation I proved he was cured, and he returned to his wife and had no further trouble. One (Case 13—a doctor) had gonorrhœa 13 years before I saw him. He had been married three years without trouble, then he suddenly flared up with a rigor and swelling of his right vesicle. I washed this out and he was able to return to his wife cured in three weeks. Another (Case 10) had become infected in November, 1920, while in this country, having left his wife behind in one of the colonies. He was pressed for time as he had to return by a certain boat and was not cured. I operated on him in July, 1921, and he was proved cured 14 days later, and just caught the boat fit to meet his wife on his return home. The last (Case 7) had *B. coli* and never infected his wife.

Five of the men (Cases 2, 9, 11, 15, 20) were in a hurry to get married, and could not put off the marriage arrangements. They were all cured in a few weeks and were married happily. Some of these cases were sterile as both vesicles and vasa were blocked. They became fertile after, as the passages were opened up. This was proved in several cases. In only one of the cases (Case 3) was the vas found full of semi-solid material, which made lavage very difficult, yet even he was cured by the procedure. In a few of the others there was some difficulty at first in pressing in the colloid silver, but in 23 cases out of 25 a fine silkworm gut thread could be passed right down to the ampulla without difficulty. The possibility of blockage of the vas must always be kept in mind, and the patient warned that if the condition is found it may render the operation ineffective.

I failed to obtain an immediate cure in four cases. In one (Case 4) the left side was completely blocked, so that this side could not be washed out at all, the right being satisfactory. He had iritis and joint trouble and I failed to cure him. The second (Case 6) had a partial block in the right vas. Only a little colloid silver could be forced through. It started drainage of the vesicle and massage effected a cure in another two months. The third (Case 23) developed a perivesicular abscess, which I had to drain through the perineum, and this led to complete cure. The fourth (Case 24) had iritis and joint trouble. The operation sterilised the vesicle, but a few months later he had another attack of iritis. This leads me to believe that iritis is in a different category to other gonococcal metastases. I believe that attenuated gonococci or their poisons get into the iris and live there indefinitely, so that it is not sufficient merely to sterilise the vesicle of gonococci to get a cure of iritis. I doubt if gonococcal iritis is ever cured—that is to say, rendered free from any possibility of relapse.

Twenty-one of the cases were immediately and effectively cured within three weeks of their operation. I think this is a most impressive statement, which fully justifies the operation for long-standing obstinate cases. The quickness of the results is little short of miraculous. These cases had all had many months, if not years, of the ordinary treatment by means of irrigation, massage, bougies, installations, drugs, and particularly vaccines, ordinary and detoxicated. Yet they had failed to obtain relief. The average length of time they had had the disease was four years, excluding the man who had had it 44 years, yet they were all cured in three weeks by vasostomy.

Seven of the cases suffered from obstinate and crippling arthritis. They were all cured in three weeks and their joint troubles simply melted away Two had iritis. In one I failed to cure the vesicle because the vas was blocked, and in the other I cured the vesicle yet the iritis relapsed later. There were only two complications. In one a spermatic fistula persisted for a short time. This was before I learnt to drop the vas back after taking out the stitches In another a perivesicular abscess developed which I drained through the perineum with good effect.

Should one do both sides as routine, or only that side on which the thickened vesicle can be felt? If in any doubt it is better to do both sides. Where it is quite obvious that only one side is at fault it is only necessary to do that side. I operated on one side in 11 cases with one failure, and on both sides in 14 cases, all of which were cured. The results are more certain if both sides are done. Five had one wash only, and four were cured; the other had to be finished by massage. Seven had two washes and all were cured. Twelve had three washes, ten were cured straight away, one developed a perivesicular abscess and one failed because the left vas was blocked One had four washes and was cured. I think it advisable to aim at three washes, though in most cases two washes will cure. *It is clear that a single wash will not cure all the cases; further washes must be ensured following on the operation.*

The colloid silver is often passed at the next few acts of micturition. Sometimes it is retained for days and is then usually passed in a nocturnal emission which stains the pyjamas black. That it fills the vesicles as well as the ampulla can be proved by radiography. The vas has a powerful sphincter, so that sperm or colloid silver coming down the vas regurgitates into the vesicle. The vesicle is certainly a reservoir of sperm. It is lined by a few layers of columnar epithelium which secrete a mucinous fluid Colloid silver appears to have a softening action on inspissated secretion and plugs present in chronic vesiculitis. When the duct is blocked a fresh opening is formed into the deep urethra through which the softened contents are discharged. This can be seen with the posterior urethroscope. Numerous other antiseptic fluids have been tried, but I find there is nothing so satisfactory as colloid silver in strengths of 5 per cent. This is also my experience in the case of pelvic lavage for renal infections.

Two of the cases were suffering from *B. coli* vesiculitis, and had suffered for years from unexplained relapsing fever and rigors. Both these were cured In one of these cases I also performed epididymectomy. Another had a mixed infection with *B. coli* and streptococcus and was cured. In two of the cases there were accompanying renal infections for which I had to wash out the kidneys. Each received two washes to both kidneys and were cured of their kidney infections.

Schedule of Cases.

Case 1.—Chronic vesiculitis one year; vasostomy 1914 with help of Dr. Herbst at the London Hospital. Proved cured in three weeks.

Case 2.—Seen May 26th, 1915; gonorrhœa six weeks Right vesiculitis July 8th. Treated until Dec. 23rd, when it became latent. On Jan. 15th, 1917, after alcohol, relapse of urethritis from right vesicle. Right vasostomy Feb. 22nd three washes. Proved cured in three weeks. August 1st 1918, marriage tests negative. Patient then married, and was seen again Feb. 1st, 1923; his wife and children have had no trouble.

Case 3.—April, 1917; gonorrhœa three years, treated for three months. Great enlargement of right vesicle June 27th, 1917, right vasostomy, canal filled by semi-solid debris, two washes given. Needed further massage, but was cured in two months from the date of operation.

CASE 4.—March 17th, 1916 ; gonorrhœa 16 years, iritis, nts, both vesicles enlarged, left orchitis. On the 31st sostomy, right side satisfactory, three washes, left vas ocked entirely, no fluid would go through. June 27th, ll had iritis and the left vesicle was not cured.

CASE 5.—In 1918 ; three years' gonorrhœa, left orchitis, nts. Left vasostomy, three washes. Proved cured in ee weeks, joints cleared up entirely.

CASE 6.—On Jan. 29th, 1920 ; six years' gonorrhœa, right chitis, right vesicle enlarged. Treated by ordinary thods until Dec. 10th without effect. On the 22nd right sostomy, one wash only. March 11th, 1921, proved red.

CASE 7.—Oct. 12th, 1920 ; since 1911 had attacks of fever, creased frequency, pain in the perineum, called " malaria." urried two and a half months, two days fever and hæmat-a, right vesicle enormously enlarged, contained *B. coli* d staphylococcus. On the 17th right vasostomy, three shes. Complete black cast of vesicle passed after the rd injection. On Nov. 8th urine clear, prostatic and sicular fluid normal, no pus. Heard from later, has had further trouble.

CASE 8.—On Nov. 10th, 1920 ; gonorrhœa eight months, ht orchitis, right vesiculitis. Seen again March 2nd, 1921, en he had had three months more treatment, still right siculitis. On the 11th double vasostomy, one wash to each sicle. On April 11th passed complete marriage tests ; t married and had no trouble.

CASE 9.—July 14th, 1922 ; gonorrhœa two years, marriage prospect. Urine clear, left vesicle immensely enlarged. gust 8th, left vasostomy, three washes. On the 24th oved cured. Nov. 21st, again tested for marriage, and oved cured. Got married and had no trouble.

CASE 10.—Married, strange connexion November, 1920, t with wife since. Has had long treatment with failure to re. Both vesicles enlarged. July 21st, 1920, double sostomy, left side one wash, right side two washes. gust 4th, 1921, proved cured and returned to wife, no uble.

CASE 11.—July 25th, 1921 ; had had three years' treat-nt for infection of right vesicle with *B. coli* and strepto-cus. Gets increased frequency, fever, and hazy urine. the 28th double vasostomy, right two washes, left one sh. August 8th, urine clear, no increased frequency, static fluid normal, vesicles normal. Had no further uble.

CASE 12.—April 15th, 1921 ; for some years had had ning in left loin accompanied by fever. In February tracted gonorrhœa and had treatment from April to tober without result. On Oct. 10th double vasostomy, washes to each vesicle ; this cured the vesicles. On the t left renal lavage, staphylococcal pyelitis. Pyelogram—ble kidney, one ureter. Right kidney tested, found to be rile. This cured the renal infection. In November thral discharge reappeared containing gonococci. This s traced to a suburethral abscess in the perineum, excised c. 1st. This cured him. Writes December, 1922, to say has had no further trouble whatever.

CASE 13.—Oct. 7th, 1921 ; 13 years ago had gonorrhœa some months, then no trouble. Married three years ago, e has had no trouble. Two weeks ago after drinking many ktails great difficulty in micturition, rigor. Came up at e to be examined. Enormous swelling of right vesicle, ter clear, no stricture. Massage of the vesicle produced and gonococci. On the 25th right vasostomy, three shes. Nov. 14th, passed marriage tests, proved cured l returned to wife. Since then no further trouble.

CASE 14.—March 21st, 1922 ; gonorrhœa nine months, atment three months ago. Joints, left vesicle much arged. March 29th, 1922, left vasostomy, one wash. ril 8th, passed marriage tests and proved cured. Got rried, no trouble.

CASE 15.—Nov. 6th, 1922 ; gonorrhœa since 1918. rriage in prospect. Has had arthritis, fever, wasting, y urine, both vesicles much enlarged. On the 13th ble vasostomy, two washes. On the 24th appeared ed, had three marriage tests and got married ; no trouble.

CASE 16.—Jan. 18th, 1921 ; six years' gonorrhœa, urine y, both vesicles much enlarged. On the 21st double ostomy, two washes. Feb. 8th, urine clear, prostatic fluid olutely healthy ; on the 23rd had passed three marriage ts, no further trouble.

CASE 17.—May 25th, 1920 ; married, living in Tropics, e at home. Developed gonorrhœa December, 1919, hritis, vesiculitis. Treated by ordinary methods up Nov. 10th, 1920, when gonococci were still found in fusion. Right vesicle much enlarged. On the 17th right ostomy, two washes. By Dec. 19th had passed three rriage tests, went back to his wife and had no trouble.

CASE 18.—Jan. 31st, 1921 ; gonorrhœa since October, 1913. Urine hazy, right vesicle enormously enlarged, fluid expressed full of pus and gonococci. Severe neurasthenia, fears gonococcal infection of kidneys. April 7th, 1921, both ureters catheterised, urine from each kidney contained staphylococci but no gonococci. Kidneys washed out on several occasions, and by May 20th proved to be free of infection. Double vasostomy, three washes. The urine remained black for five days after the last wash. June 23rd, urine clear, no albumin, prostatic fluid absolutely healthy. Proved cured.

CASE 19.—Feb. 19th, 1920 ; since August, 1914, has had continual attacks of fever, increased frequency, pain in perineum, hæmatospermia. Right vesicle immensely enlarged and contained pus and *B. coli*. Prostatic massage relieved for a time, but in December, 1922, sharp relapse with high fever. On the 6th, right epididymectomy, needle stitched into right vas, left vasostomy. Three washes to each side. Since April, 1923, urine clear, prostatic fluid healthy, has had no more trouble.

CASE 20.—Jan. 23rd, 1920 ; for three years latent relapsing gonorrhœa which appeared to get well and then burst forth again. Urine hazy and right vesicle enlarged and containing pus and gonococci. Relapses Nov. 11th, 1920, August 2nd, 1922, and Dec. 14th, 1922. Persuaded to undergo vasostomy as marriage was in prospect. Jan. 8th, 1923, double vasostomy, three washes left side, two washes right side. By March 9th, 1923, had passed all marriage tests, and was proved cured. Got married, no further trouble.

CASE 21.—Jan. 14th, 1915 ; had gonorrhœa for two years, with three relapses. All the usual treatment had no effect, the right vesicle being much enlarged. On June 28th right vasostomy, four washes given. Seen August 4th, no treatment for one month, taken alcohol freely, urine clear, prostatic fluid absolutely healthy, cured. Seen again April 2nd, 1916 ; had had no further trouble.

CASE 22.—Oct. 9th, 1915 ; married ten years. Recently developed gonorrhœal right knee, left wrist acute synovitis, has had five injections of vaccine, joints still as bad as ever. Urine dense, hazy, left vesicle much enlarged, acute arthritis right knee and left wrist. Oct. 15th, double vasostomy, three washes to each side. Joint trouble completely disappeared in ten days after the first wash. Nov. 25th, proved cured and returned to his wife. Sept. 9th, 1916, wrote to say he is quite well and his wife has had no trouble.

CASE 23.—July 25th, 1914 ; three years' gonorrhœa, right vesicle. Had all the ordinary treatment until Oct. 18th, 1915 ; kept on relapsing from right vesicle. On the 20th right vasostomy, three washes. Nov. 2nd, perivesicular abscess developed. On the 3rd abscess opened by perirectal incision, urinary leak. Dec. 3rd, abscess and urinary leak had healed. Tested continually from the 16th to Jan. 1st, 1916, and proved to be cured. Has had no further trouble.

CASE 24.—Nov. 27th, 1922 ; aged 65, had gonorrhœa 1878, arthritis, iritis. Married 27 years, wife has had joint trouble for which she could not be examined. Has had relapsing iritis ever since 1878 and right orchitis. Both vesicles greatly enlarged, fluid expressed contained pus and gonococci. Urethra—multiple strictures. Dec. 18th, 1922, internal urethrotomy, double vasostomy, three washes to each. Jan. 6th, 1923, urine clear, prostatic and vesicular fluid absolutely healthy and contained no pus. Apparently cured of his vesicular infection. Nevertheless later on he developed another attack of iritis. There is a possibility he re-infected himself from his wife.

CASE 25.—May, 1914 ; gonorrhœa one year, married, in a hurry to get back to his wife. Right vasostomy, three washes, cured in three weeks.

Conclusions.

A seminal vesicle infected with the gonococcus or *B. coli*, or other germ, can remain blocked and full of the infecting agent for many years. The victim may suffer from relapsing fever and rigors, from relapsing urethral discharges, from arthritis or iritis, from impotence and sterility, and from neurasthenia. In some cases the neurasthenia is so severe as almost to amount to a psychosis. All these troubles, except the iritis, can be cured by vasostomy.

What, then, are the indications for this operation ?

1. I think it is clearly established that it should be employed in all cases of chronic relapsing gonorrhœa (or *B. coli* or streptococcal vesiculitis) in which there is evidence of a thickened closed vesicle or vesicles, and in which four to six months' consecutive and careful treatment by massage, urethroscopy, and so forth, has failed to produce a cure.

2. It should also be used for cases of chronic arthritis with chronic relapsing epididymitis that do not yield to such treatment.

3. It should also be used for cases of relapsing attacks of fever, rigors, and pyuria, and epididymitis caused by the colon bacillus or other germs, such as streptococci.

4. Finally, I believe it should be used for many cases of severe arthritis in the early stages. Belfield has reported 83 cases of acute posterior urethritis with acute vesiculitis and arthritis, where immediate amelioration has been obtained by vasostomy. In the future I intend to try it for such cases.

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PARENCHYMATOUS HYPERTROPHY OF THE BREAST.

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HYPERTROPHY of the breast or parenchymatous hypertrophy of the breast is a remarkable phenomenon, most of the cases being so striking that they are either shown at a local medical society or reported in the press. Thus, in spite of its rarity, a great number of cases occur scattered throughout the literature.

A Case Described.

A married woman, aged 27, attended my out-patients' department at St. Mary's Hospital in the beginning of 1920, having been to many other hospitals previously.

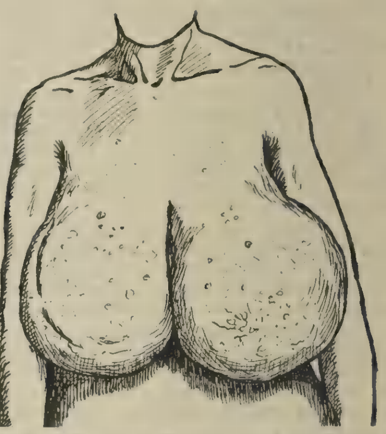
History.—Her breasts had always been large as a girl, though nothing very remarkable. In 1918 she attended hospital and was informed that there was an adenoma in the right breast; she was admitted and the adenoma removed. Later she married, and she was now two months pregnant.

Condition on Examination.—Both breasts were very large, the left being the larger, while the right appears to have had a large piece removed from the upper and outer quadrant, where there is a scar. (See drawing.) The veins were enormously distended, the nipples quite flattened and flush with the skin, the areola enlarged and deeply pigmented. The breasts were very nodular and lumpy and felt as if they were full of large adenomata. She had been advised to have her breasts removed.

Treatment.—She was sent to Dr. Harrison Orton for X ray treatment which had very little effect, and the increase in size went on. At the fifth month of her pregnancy she aborted and the breasts rapidly diminished in size. In January, 1923, the breasts were still large and very pendulous, especially the left one; both were flabby and soft, the lumpiness could still be felt, and the veins were still prominent. She had not been pregnant again, her menstruation had always been normal, but lately had been painful.

Nomenclature.

The condition has been known under many and varying names, such as "virginal hypertrophy," "massive hypertrophy," "diffuse hypertrophy," and lately Dr. David M. Greig has introduced the term "puberal hypertrophy." All these terms indicate the increased size of the breast, and some, such as "virginal" and "puberal," attempt to combine some other characteristic of the condition in the name. The term virginal is inaccurate, as the condition has nothing to do with virginity, while puberal rather confines it to puberty, whereas some of the best marked cases occur in early married life. Greig, who uses this term, subdivides it again into hypertrophy of puberty and hypertrophy of the puerperium; this again is inaccurate, as it is during pregnancy that the enlargement takes place, an during the puerperium that there is often a retur to the normal. No doubt under this term ar included cases which are not really true hyper trophies. Very obese individuals may have enormou breasts in no way pathological, but merely due t large collections of fat. Even young people can b afflicted in this manner, as in one of Keyser's case where the girl was only 19 years of age. In som cases chronic interstitial mastitis may increase th bulk of the organs sufficiently for them to be include in the term hypertrophy. Some cases in people ov 40 years of age are of this nature. In many case as we shall see, there is a mistake in diagnosis; it i probable that cases of acute cancer have bee included, and certainly many cases with large an rapidly growing lipomata or adenomata, and perhap even elephantiasis.



Drawing showing enlargement of the breasts.

Some writers exclude from the category of tru hypertrophy all cases in married women where ther is a permanent enlargement associated with preg nancy, but I cannot understand why. In true case we get a real hypertrophy, all the tissues of th breast taking part in the enlargement. For thes reasons I have preferred the term parenchymatou hypertrophy of the breast, as that accurately describe the condition at whatever time of life it occurs. Th term parenchymatous was also employed by Dursto in 1669 when describing the post-mortem appearanc in the earliest case on record. The condition has als been described as occurring in men, but in them th disease seems so essentially different, whatever th form of gynæcomastia met with, that I do not includ them.

Cause and Ætiology.

The cause of the disease is quite unknown. Traum cold, heat, and irritation have no effect; celibac and heredity have no influence. The breast bein one of the organs necessary to complete the proces of generation, the association between it and th other sexual organs has long been recognised, and i this disease the association is emphasised. Tw facts stand out clearly. The enlargement of th breasts begin first at or about the age of pubert and, secondly, during pregnancy. Obviously, ther fore, it must have something to do with the othe sexual organs or sexual secretions, but what thi association is we do not know. There are only tw cases on record with any known organic disease i the organs of generation—Bartel's case, where girl of 14 had an infantile uterus and very sma ovaries, and Gran's case, where a girl of 15 ha tuberculosis of the lungs and ovaries. The moder view is that the condition is due to a hormone o lack of, or excess of, a hormone, secreted by part o the sexual apparatus, which means that very little i yet known about it. The great stumbling-block t the hormone theory is the fact that sometimes th dition is unilateral. Of the 185 cases within my ›wledge 145 were bilateral, and only 40 unilateral. is interesting to note that when accessory breasts :e present, as in Warren's case, all the breasts took of the enlargement. Any general stimulus mammary growth should affect both breasts, and influence should not be restricted to one side. ilateral cases, however, are not an insuperable tacle to the acceptance of the hormone theory. know that hormones and enzymes often act by rating other substances which then act directly the tissues. If that other substance were present one organ and absent from the other the hyperphy might occur only on one side. This would › help to explain such extraordinary occurrences that reported by Young of four sisters who all had ilies, but none of the four had any milk in the breast.

ometimes a parenchymatous enlargement of the roid gland in a young girl comes on at puberty, part of the thyroid gland may remain unaffected. elieve these conditions are analogous, the more so that enlargement of the thyroid gland sometimes ıes on during pregnancy. Moreover, parenchytous hypertrophy of the breast very commonly rts at the time of puberty. In most patients who 'e menstruated, menstruation has ceased before ›ertrophy is noted. In others, after the breasts 'e attained a certain size, menstruation has sed; in one case the growth stopped with the sation of menstruation. Hutchinson reported a e which preceded the onset of menstruation. ere is, therefore, usually some irregularity of ıstruation which either precedes or accompanies change. Pregnancy is a powerful stimulant to mmary growth normally, and sometimes this ease in size may pass the physiological bounds. these cases the conclusion of pregnancy often mits the breasts to return to normal. Monod orted a case where the breasts became enormous three consecutive pregnancies, but returned to mal in the intervals. Rosinski had a case in ›m this process was repeated four times.

'he rate of growth is, as a rule, slow, and somees intermittent, though in Zarukow's patient only › and a half months were needed for the breasts reach a circumference of 57 and 59 cm. In the liest case of which we have records, that reported Durston by letter to the Royal Society in 1700, condition was said to have occurred in one night. s case, however, occurred at a time when imaginaı played a greater part in medicine than it does ', and probably the lady suddenly awoke to the ; that her breasts were much larger than they uld have been. The case was as follows :—

liz. Trevers, aged 23, "fair of complexion, brown haired, n healthy constitution, low of stature, of honest repute, of mean and poor parentage." This lady was said to e woken up one morning to find her breasts so large that could not turn or even sit up in bed. Menstruation had 'ped some six months previously. Within the short :e of two months the skin gave way and ulcers formed she died a month later of septicæmia. A limited posttem examination was allowed; the left breast weighed ›ounds, and the right one 40, the left one was 3 feet nches in circumference. "Upon opening it we could neither water nor cancerous humours, nor anything ›us, more than the prodigious bigness, and the tubuli, parenchymatous flesh were purely white and solid, and ther than what we see in the soundest breasts of women, ıe best udders of other animals."

'ther cases which have reached enormous propors may be mentioned :—

Hamilton	right 27½ lb. ;	left 24½ lb.
Owen	„ 22 „	„ 23¾ „
Robert and Amusat	„ 30½ „	„ 20½ „
Dennis and Billings	„ 18 „	„ 18 „
Huston	„ 12 „	„ 20 „

Porter, the breasts weighed 40 lb. between them.

table drawn up according to the age at which condition was known to occur is very striking. 161 cases in which the age was mentioned the res are as follows.

Between the ages of 11 and 15 there were	43	93	143
„ „ 15 „ 20 „	50		
„ „ 21 „ 25 „	26	76	
„ „ 26 „ 30 „	24		
„ „ 31 „ 35 „	11		26
„ „ 36 „ 40 „	8		
„ „ 41 „ 45 „	5		
Over this age .. .. 48 „	2		

Here we see there are 93 cases of 20 years and under, and 76 over this age, there were 143 cases under 30 and only 26 cases above this age—that is to say, the great majority of cases occur during the age of greatest sexual development and the numbers become progressively fewer as age advances. After the age of 30 the falling-off of the cases is remarkable. The youngest case mentioned as having a great enlargement was 12, though a small one is mentioned at the age of 11. Of the two at the age of 48, one, from the account, was possibly due to a tumour and not to hypertrophy.

Symptoms.

Apart from the increase in the size of the breasts there are no symptoms. The breasts increase in size and still retain their rounded contour, though this may be irregular and bulgings occur in places. The skin over the breast is quite movable and at first apparently normal, though enormous striæ appear in it as the result of its stretching. The veins are distended and clearly seen coursing under the skin. In some cases the breasts are much engorged and of a dusky hue. Durston, Billroth, Simpson, Greig, and others have noticed that the stretched skin has given way and ulceration has taken place. When this occurs, necrosis of the underlying breast tissue usually follows, with septicæmia and death, as happened in all these four cases. McGavin's case was four months pregnant and the breast enlargement was "accompanied by diffuse inflammation," and the breasts "were hot, red, tender, dusky, nodular, long, and pendulous." Abortion was induced, followed later by amputation of the breasts and recovery.

The nipple as a rule becomes flattened out and flush with the surface, and is quite useless for suckling. At the same time the areola becomes much enlarged; it may fade and be difficult to see in non-pregnant patients, but usually becomes darker and more pigmented than normal in pregnant ones. Often the breast feels nodular and irregular, and more like a lactating breast, or even as if it were full of small adenomata; this, as we shall see later, has led to a false idea of the pathology of the disease. In the case under my care, I believe the nodulation was sufficiently well marked to be mistaken for an adenoma and was removed before the general enlargement was sufficient to attract attention to the true nature of the disease. There is no pain experienced during the increase in size, and except for the irksomeness of carrying the large organs about, there is no inconvenience. Porter has reported a case where the breasts were so large and their weight so oppressive that the patient had a frame made to support them on as she lay in bed. Ehrenhaus recorded a case which experienced a good deal of pain, but she also suffered from galactorrhœa, and often a quart of milk escaped from the enlarged glands in 24 hours. After a time the weight of the breasts tends to draw them away from the chest wall, and they hang as by a pedicle. In young girls, where one breast is larger than the other, spinal curvature may be caused by the unequal weight; this was so in Menteil and Benôit's girl of 14½, and also in the false case in a girl of 15 under Mr. Ernest Lane, reported later on in this article.

Pathology.

In cases of true hypertrophy the condition is a parenchymatous enlargement of the glands, all the component tissues taking a share. In a few cases described as hypertrophy the increase in size has been found to be a great deposit of fat, but here there would not be the nodular feel which has been described in the true cases. In the post-mortem examination of the case reported by Greig, which was conducted by Prof. L. R. Sutherland, the report was shortly as follows :—

> "To the naked eye the condition seemed unusual. Seems to be generalised hypertrophy, with glandular hyperplasia in nodular form. General appearance suggests benign lesion. Microscopical examination showed the structure mainly fibrous, with gland spaces filled with altered epithelium." Greig continues "that the peculiar shedding of the epithelium into the gland spaces and ducts was as is found in some cases of great glandular activity. The distension so produced, together with the decided glandular hyperplasia, brought about a sort of nodular formation of gland tissue, suggestive of, but in no way of the nature of adenomata."

This last sentence is significant as there is an idea current that the condition is fibro-adenomatous, and at a meeting of the Royal Society of Medicine, where a case of hypertrophy of the breasts was shown, two speakers of eminence declared the condition to be "fibro-adenomatous." If by this term they meant that the enlargement was due to the development of fibro-adenomata, I can only say that such is not the fact, no case having been so reported after investigation. Billroth's description on post-mortem examination on one of his cases was as follows :—

> "The cross section of the mamma resembled that of a uterus studded with numerous fibromata, but the tumours were softer and contained more juice than ordinary uterine fibrous tumours."

This evidently refers to the nodules described by Prof. Sutherland. Neither Billroth nor Sutherland thought the nodules resembled fibro-adenomata. If, on the other hand, the speakers meant that the fibrous and adenomatous elements of the glands were enlarged, they should also include the fatty tissues, and the condition becomes parenchymatous. If they spoke of a parenchymatous change, then the term fibro-adenomatous had better disappear in connexion with the disease, as it is the term intimately associated with the common fibro-epithelial tumour of the breast.

Diagnosis.

This would seem so obvious that it need not be dilated upon, but this supposed ease of diagnosis has sometimes been very detrimental to the patient. We find many cases recorded in which the breast has been removed, and to the astonishment of the operator the condition has proved quite different from that expected. Surgeons of the highest eminence have been deceived. Thus Billroth removed what was thought to be a case of unilateral hypertrophy and found that it was a huge retro-mammary lipoma. Brodie very nearly did the same thing. It is especially necessary to be careful in unilateral cases. Greig does not believe that unilateral cases can occur, and thinks they are always due to causes other than pure hypertrophy ; while not agreeing with him, I would urge special caution in dealing with them.

The following is an example :—

A girl, aged 15, was admitted to St. Mary's Hospital under Mr. Ernest Lane on March 18th, 1905, for hypertrophy of the right breast.

History.—In January, 1904, the right breast was noticed to be larger than the left, and it has gradually grown since that time. There was no pain till about six weeks ago, since when there has been a slight aching. She had had to wear the breast in a suspender. She began to menstruate when 14 years old, a little irregularly at first but now regularly. During the periods the breast always swelled perceptibly.

Condition on Admission.—The patient looked well and had a good colour. The right breast was much larger than the left and hung down to within an inch of the umbilicus. The veins over it were enlarged and the nipple flattened. The breast felt full of hard masses from the size of a walnut to that of a hen's egg ; it felt very heavy for its size. There were two hard glands in the axilla. The right labium majus was the same size as the left.

Operation.—The breast was removed by an incision round its base. It weighed over 3 lb. after the fluid had run from it, was hard and lumpy to the feel, but contained no cysts.

Microscopical Examination.—The tumour was an adenoma, and the drawing which accompanied the account showed the thin flattened out breast, underneath which lay a large adenoma.

Hoenigsberger illustrates a similar case in whic
the enlargement was due to enormous bilateral fibr
adenomata. Muchanoff illustrates an equally extr
ordinary case. The appreciation of these mistak
may have had something to do with the suppositic
that true parenchymatous hypertrophy was due
fibro-adenomata. Deaver and McFarland give a
excellent illustration of a case of apparent symm
trical hypertrophy due to bilateral lipomata. The
is a possibility, too, of mistaking elephantiasis of tl
breasts for hypertrophy in those who have been
the East ; Manson illustrates a case in which, howeve
the diagnosis was rendered easy by the fact that tl
left leg was affected as well. These mistakes havi
been recorded, we may be quite sure that there a
others in which the perpetrator has not been qui
so frank. It is just as well, therefore, to dra
attention to the fact that unless care be tak
mistakes can be made as easily in this disease as
any other.

Treatment.

There are sufficient cases recorded in which tl
condition improved owing to some change in tl
sexual influence, such as menstruation ceasin
pregnancy commencing, or, more frequently, pre
nancy ending, to warrant a waiting policy bei
adopted at the outset. Some observers think th
these are not cases of true hypertrophy simp
because they get well of themselves, but as we kno
really so little of the true cause of the disease th
opinion seems to be hardly warranted. Local measur
such as pressure and massage may be tried, potassiu
iodide or collosol iodine may be given as an altern
tive, but none of them have much effect. Mamma
extract has been administered without result. O
would rather expect that extract of the uteru
ovaries, or corpus luteum, or a mixture of them mig
have a better effect. In one case I tried a course
X rays which the patient declared had no effect, a
probably the conclusion of the pregnancy was tl
real cause of the return to normal.

When the breasts are not so enormous as to impe
movement it is best to counsel patience, especial
in young girls. In some patients, however, tl
general health suffers severely, either from tl
disease or from anxiety, worry, and self-consciou
ness, and in these cases operation should be advise
It is remarkable with what unanimity all write
record the fact that the general health improv
immediately after the removal of the breasts. Whe
the breast increases in size during pregnancy a
diminishes after parturition, the patient must ma
her choice. Usually the breast is useless for sucklir
as the nipple has disappeared ; in Zarukow's, Mentei
and Benoit's cases, to mention only two, the breas
were functionless after parturition. It is for tl
patient to decide whether she will retain the
enormous but useless appendages, which are oft
very much in the way, merely for sentimental reason

In all cases where the breasts are becoming undu
dusky, congested, or inflamed, or where the sk
threatens to give way, amputation should be pe
formed without delay.

The operation is easy, a visible scar can quite w
be avoided, and the disease is cured at once.
bilateral cases one breast should be amputated, a
after an interval of three weeks or more the seco
breast can be dealt with. The existence of pregnan
seems no bar to the operation, which is remarkab
free from shock. In amputation of the breast it
advisable that this be carried out by two flaps,
large flap cut from the front of the breast and a sm
one fashioned from below. When the breast
removed the large anterior flap can be sewn into t
position of the normal costo-mammary groove. If
certain amount of the breast tissue be left a ve
fair breast can be reproduced ; it will have no nipp
but the appearance will be quite presentable, a
there will not be the disfigurement usually left
such operations.

(*Continued at foot of next column.*)

THE DIGESTIVE FUNCTION IN PULMONARY TUBERCULOSIS.

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THAT every phthisical patient has been, is, or will become, a dyspeptic is probably the most definite statement to be found in the literature of pulmonary tuberculosis.[1] Not only will he be afflicted with indigestion, but constipation with intermittent attacks of diarrhœa and abdominal pain will add to his difficulties. In not a few cases this almost inevitable disturbance of digestive function causes more discomfort and disability than do the symptoms directly referable to the lung condition. Daremberg said, "l'estomac est la place forte des phtisiques et l'alimentation leur grand moyen de défense."[2] It still remains, to-day, a desirable part of the treatment of pulmonary tuberculosis—if only from the point of view of the patient's comfort—to safeguard this bulwark of defence. More rational methods of dieting have replaced the excessive feeding insisted upon by Walther,[3] and the stereotyped prescription of milk in large quantities is gradually ceasing to be a fetish, but the most suitable diet will be given only when the true nature of the alimentary derangement becomes known.

Hyperchlorhydria Probably Fortuitous.

Hyperchlorhydria and hypochlorhydria have been reported with equal frequency, Fishberg stating that "analyses of the gastric contents have not revealed any constant changes."[4] From the findings in fractional gastric meals and the results obtained by treating a still larger number of cases according to the conclusions derived, it would appear that hypochlorhydria or hyposecretion is the rule when dyspepsia is the sequel of infection of the lungs by tubercle bacilli. Quite a number of phthisical patients have had hyperchlorhydria for many years prior to their becoming tuberculous, and consequently their indigestion bears little or no relation to their lung condition; I would suggest that these cases may have formed the majority of the cases of hyperchlorhydria that have been reported. One patient, who had had a gastro-enterostomy for ulcer performed two years previously with but temporary relief, stated that her indigestion became less severe when her chest began to trouble her. This history is not uncommon where the dyspepsia has been of long standing, but it must not be confused with a similar history obtained in cases of gastric mode of onset in which the dyspeptic symptoms become less marked as the pulmonary symptoms appear. It should also be remembered in this connexion that hypersecretion may be present without symptoms in an otherwise normal subject.[5]

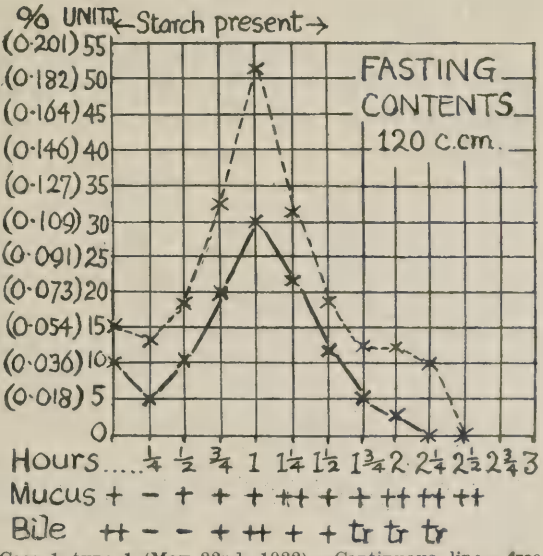
It is suggested, then, that the usual effect of tuberculosis in the digestive function is one of inhibition, the quality and quantity of the gastric secretion depending on (1) the degree of inhibition, and (2) the quality and quantity of the secretion prior to the tuberculous onset.

Illustrative Cases.

The charts obtained in these cases of hypochlorhydria are of two types. The first, as exemplified in Case 1, shows reduced acidity, though 30 units are usually established, and rapid emptying of the stomach. The indigestion in these instances is never severe and readily yields to treatment directed at the stimulation of gastric secretion. Hunger pain coming on two hours or more after a meal is the predominant symptom, which is temporarily relieved by the ingestion of food. This type is uncommon, and at present it is difficult to say whether it is the result of slight inhibition or only an early stage of the second variety.

CASE 1.—(First type, Chart 1.) The patient, a male aged 57, was admitted complaining of cough for past two years. Sixteen years previously he had a slight hæmoptysis, after which he became subject to coughs and colds. Two brothers died of pulmonary tuberculosis, aged 29 and 31. Three months prior to examination the patient's appetite failed, and he began to feel worse. Epigastric pain occurred between one hour and one and a half hours after meals, and continued until the next intake of food, which usually, though not always, relieved the symptom. No history of vomiting was obtained, but nausea coming on at the same time as the pain was complained of. Constipation had been obstinate during these months.

CHART 1.



Case 1, type 1 (May 22nd, 1922).—Continuous line = free acid curve; dotted line = total acidity curve; tr. = trace.

Abdominal Examination.—This proved negative, save for the detection of a slight epigastric fullness and tenderness on the left iliac fossa.

Chest Condition.—Marked fibrosis of the right upper lobe with infiltration of the middle and lower lobes of the same side. The left upper lobe was also infiltrated. Rhonchi were heard extensively over the chest.

Radiological Report.—Stomach slightly low, but tonic vigorous peristalsis. No filling defects or spasmodic contraction. Duodenal cap normal. Six hours after ingestion the stomach is empty and the food occupies the terminal coils of small intestine, cæcum, and ascending colon.

The second type of chart, as shown in Cases 2 and 3, is much more common, and forms the basis of this communication.

CASE 2.—(Second type, Chart 2.) The patient, a male, aged 36, was admitted on April 4th, 1922, with very extensive tuberculous lesions of both lungs, with a cavity in the right upper lobe. Whilst at a sanatorium in the south of

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(*Continued from previous column.*)

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England in the preceding November he first became subject to indigestion, which commenced as a feeling of fullness after the evening meal. About January, 1922, the condition became worse, flatulence occurring after each meal and at nights. Had never had any actual pain or vomiting and only two short attacks of slight diarrhœa.

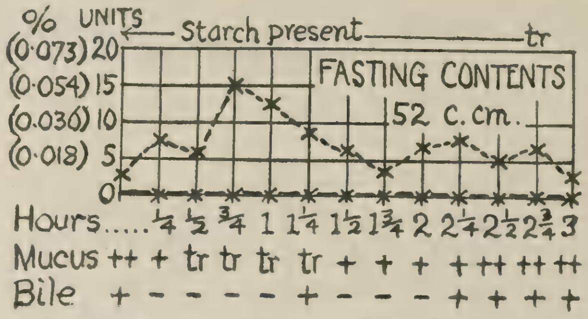
Whilst under observation it was noted that the flatulence continued for about one hour after each meal, but that the patient would be awake for two hours each night (between 12 and 3 A.M.) on account of eructations and the passage of flatus. Fish, eggs and milk, and fat of all kinds seemed to aggravate the condition.

On May 17th, 1922, the acid mixture and dimol were first administered, and one month later, immediately prior to transfer to sanatorium, all symptoms had abated. After transfer the condition recurred, but when the same lines of treatment were used the symptoms again diminished, but the patient died on August 3rd from tuberculous meningitis.

I am indebted to Dr. Frederick Heaf, of Colindale Hospital, for the post-mortem findings from which I quote:

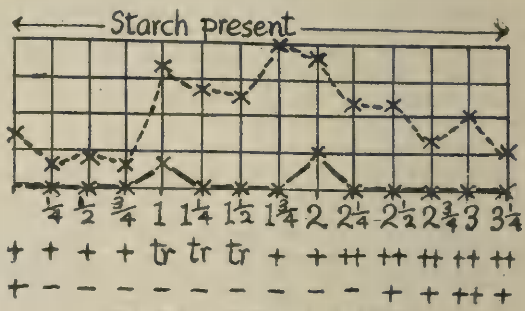
"There was extensive tubercular enteritis and appendicitis with large abdominal glands. The mucous membrane of the stomach was swollen, and there were many small submucous hæmorrhages, giving a very congested appearance to the surface, particularly toward the cardiac end."

CHART 2.



Case 2, type 2 (May 16th, 1922).—Tubercle bacilli were found in the fasting contents.

CHART 3.



Case 3, type 2 (June 23rd, 1922).

CASE 3.—(Second type, Chart 3.) The patient, a female aged 27, was admitted on Feb. 27th, 1922, with left-sided disease, and complaining of palpitation and sleeplessness. A left artificial pneumothorax was induced on March 3rd. Incomplete collapse was effected, and a pressure of +8 cm. of water maintained in the hope of increasing the degree of collapse, but as the palpitation became more marked the pressures were lowered to +1. As the palpitation continued, compelling the patient to remain in bed, a gastric examination was made, though dyspeptic symptoms had not been a marked feature. Refills, which had been given weekly, were stopped on June 8th.

The fasting contents measured 45 c.cm., and contained a few sarcinæ. Fillings were resumed on June 30th, the palpitation having diminished in severity after the administration of acid and an intestinal disinfectant. Gastric treatment was continued for about two months, and, at the time of writing, she is now up all day, working on second grade for two hours each afternoon and having refills with an end pressure of 1½ cm. water every ten days. There have been no attacks of palpitation during the last eight weeks.

Symptoms.

The following symptoms are noted in association with the second type of chart (Charts 2 and 3).

(1) *Flatulence.*—This occurs from a quarter to half an hour after meals, and whilst of short duration in the morning and mid-day becomes marked after the afternoon and evening meals. In the more severe cases flatulence accompanied by intestinal flatus occurs towards midnight, or the early hours of the morning, about five or six hours after the last intake of food. One case—the most severe in our series—lost two to five hours sleep each night on this account.

(2) *Pain.*—When questioned the patient will describe a feeling of "fullness" or "tightness" rather than actual pain. After meals the "tightness" is more or less restricted to the epigastrium, and is relieved by eructations, whilst at night it becomes more generalised, and is relieved by the passage of flatus.

(3) *Nausea.*—May be constant or may come on at the sight of food, during, or immediately after a meal; the latter time being commonest. It is never intense, but is probably the earliest symptom of which complaint is made.

(4) *Vomiting.*—This is never a marked feature, and when it does occur is usually the climax of an attack of coughing, or is the result of irritation of a lesion of the pharynx or larynx during swallowing. Morning vomiting occurs in a few instances from time to time, but the attacks rarely last longer than one week.

Intolerance of Fats.

The main feature is the intolerance of fats alone or in a mixed diet. Whilst some patients state that they cannot take fat of any description since it increases their indigestion, the majority find less inconvenience if they take their fats alone rather than mixed with proteins. Soups are often avoided by them because of the fat, and fat is cut off bacon unless it be crisp, whilst milk or milk and egg is felt to increase the symptoms. Cod-liver oil and malt and milk are disliked by the majority of tuberculous subjects, and almost universally by them if their dyspepsia is marked, but numbers take both, though they disagree, simply on account of medical advice.

Clinical Examination.

Examination of the abdomen in early stages often proves negative. In the later stages, however, the stomach is more often dilated, though succussion is not common, whilst the cæcum is almost invariably dilated, and splashing is easily elicited. The colon is frequently palpable as a hard tender band in the left iliac fossa, the tenderness being most marked in long-standing cases with chronic constipation. Epigastric tenderness, if present, is slight, and hyperæsthesia seldom, if ever, present.

Gastric Analysis.

(1) *Resting Gastric Contents.*—This varies from 25 to about 75 c.cm., but owing to the quantity of mucus present it is difficult to be certain that the stomach has been emptied. In one case it was impossible to obtain more than a few cubic centimetres, though the tube was withdrawn and cleaned three times, whereupon the examination was abandoned. Micro-organisms—staphylococci and streptococci—are often present in greater numbers than would be likely to result from contamination. Lymphocytes are commonly found in cases where the chest condition is advanced and the amount of sputum considerable. The amount of bile varies considerably.

(2) *Acidity, &c.*—The free acid may be absent, present in small amounts at intervals, or constantly present, but reduced in amount, the total acidity then following the free acid curve. Thirty units, or 0·1 per cent., is seldom established. Starch is still present after a gruel meal at the end of three hours or longer. Bile is rarely present before two and a quarter hours after the test-meal has been given. Mucus—both mixed and free—is present in con-

iderable quantities, and increases in amount towards he end of the examination, but there seems to be ittle relation between the amount present and the everity of the symptoms.

General Inhibition of Alimentary Function.

The symptoms and clinical findings point to a general inhibition of alimentary function. The ongue is usually dry and furred as a result of contipation; the unpleasant taste in the mouth, to which this condition gives rise, tends to increase the anorexia and intensify the distaste for food, which n turn inhibits the salivary secretion, thus completing a vicious circle. Owing to the dryness of the mouth, particles of food will adhere to the teeth, undergo bacterial decomposition, and give rise to dental caries and fermentation. In the absence or diminution of free acid, the gastric secretion loses its bactericidal properties and the digestion of proteins s incomplete, so that the protein derivatives undergo bacterial decomposition in the intestine. The greater amount of this contaminated saliva swallowed at night will tend to increase the bacterial decomposiion, and so the more severe flatulence and the nocturnal occurrence of distension and flatus are explained. The intolerance of fats is possibly due to heir favouring this decomposition by their tendency o form a film over the proteins, which are thus prevented from coming into contact with what little acid may be present. Fats also seem to have the power of lessening the secretion of acid or of engthening the time taken by the stomach to empty tself.

The result of this continued distension and irritaion of the intestine may be, at first, increased peristalsis with diarrhœa, but will ultimately be general stasis with constipation. As the intestinal ontents remain longer in the cæcum than elsewhere, t is only to be expected that this viscus would be onsiderably affected, dilatation being usual. As is o frequent when the tone of the cæcum is diminished, "greedy colon" is present, and this gives rise to a hard dry stool.

In the absence of the maximum peristalsis of the tomach, which only occurs when the free acid eaches 30 units,[6] and with the delay in the regurgitaion of bile and the presence of a dilated cæcum, it s not unreasonable to suppose that the ileo-cæcal valve is incompetent and fails to respond to its normal activator, the entry of food into the empty tomach. Each of these defects will tend to increase he loss of tone of the whole alimentary tract. Whether he diminution of the free acid is the direct result of he presence of tubercle bacilli in the stomach, or is he result of toxæmia, is uncertain, and while Rehfuss has, in many cases, found the bacilli in the fasting ontents with greater ease than in the expectoration,[7] and the writer has found them in more advanced ases, it is more reasonable to suppose the toxæmia o be the cause. It seems apparent, however, that he diminution of the acid is the key to the ensuing disturbance of the whole alimentary tract.

Treatment.

(1) The mouth and teeth should be kept clean by n acid mouth-wash used each night and morning. All carious teeth should receive attention. It is ssential that no particles of food should remain in he mouth after the evening meal.

(2) Acid. nitrohydrochlor. dil. should be given n doses of 10–30 minims before or during each meal. This helps to make up the deficiency in the gastric ecretion and to increase its bactericidal properties. n most cases sodium bicarbonate taken before meals will excite secretion, but in the dyspepsia of tuberulosis—with the possible exception of type 1—it eems as if this stimulation is insufficient. The acid s, however, a definite stimulant to the salivary ecretion, and this latter action may be increased by ombining it with the infusions of gentian, calumba, r quassia. Glycerine pepsin may be added, for lthough it is held that pepsin is rarely, if ever, diminished to any appreciable extent, hyposecretion is so often coincident with hypochlorhydria that this ferment may be diminished in amount. Medicinal treatment seems incomplete without an intestinal disinfectant. Salol and dimol were used, the latter proving more effective. One tablet night and morning seems to be the required dose, as in one or two instances diarrhœa which had occurred ceased when the number taken was reduced to the two per day, and it was thought that the larger dose was proving too strong in its action.

(3) With regard to aperients, an intelligent patient will soon learn to appreciate a thorough bowel action, and will make known the presence of an insufficient though regular action. When the cæcum has become dilated and the colon "greedy" agar-agar, which appears to have a greater affinity for water than that developed by the colon, should be added to the aperient, the best of which is probably liquid paraffin. Aperients which have an irritant action should be avoided. The patient should be advised as to the desirability of regular defæcation, in the hope of regaining the action of the ileo-cæcal valve as the general tone of the tract improves, which it will do if the condition has not become chronic.

(4) No dyspeptic patient should be required to take an excessive diet. Although this might increase his weight, it would assuredly increase his dyspepsia. The individual taste should be considered, and the diet altered to suit it. An attempt should be made to present the food in such a way as to excite psychical secretion. Milk should be given in moderation, and the addition of citrate of soda will often prove effective in overcoming any difficulty experienced in the assimilation of moderate or reduced amounts. Any mixture of proteins with fats in a liquid form should be avoided. Meats are better cooked in their own juices; milk should not be given at meals at which meat is served; fish should not be fried in oils, and, if possible, the fat on protein should be crisp—as, for example, that of bacon. Carbohydrates, which are known to excite the secretion of acids, though they do not require or use it, should be served at meat meals.

If the above treatment is carried out an increase in the amount of food which a dyspeptic consumptive patient can digest without discomfort will often be noted, with an improved reaction to the specific pulmonary treatment which has been adopted in that particular instance.

I wish to record my sincere thanks to Dr. J. J. Perkins and Dr. L. S. T. Burrell for permission to investigate their cases at Brompton Hospital, for their kind advice, and for their interest and encouragement in this work.

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Public Health Work in Czecho-Slovakia.—The Czecho-Slovak Ministry of Health, with a view to securing improved coöperation between voluntary and official health agencies, has lately issued a circular letter to district health officers, inviting them to coöperate in the programme of the Association for the Protection of Mothers and Children and the Masaryk League against Tuberculosis. It is proposed to establish a local branch of the League, with a dispensary, in every district which has approximately 60,000 inhabitants, on lines agreed upon by the organisations represented in the National Council of Social Hygiene, which held its summer session on July 4th. It was then decided that the Red Cross, tuberculosis, child welfare, temperance, and venereal diseases associations and the associations for the social welfare of the young and the education of cripples should also possess centres in each district of similar population. It is hoped that this coördination of effort will increase efficiency and prevent overlapping of work.

TRAUMATIC RUPTURE OF A HYDRONEPHROSIS.

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A case of this rare accident having recently come under my care, I feel that the clinical history may be of interest. A somewhat cursory search of the literature has enabled me to trace 11 previously reported cases, which, with two exceptions emanating from America, are all reported in continental journals; a list of these cases is therefore added, with a very brief review of the cases. I know of no English case or specimen which illustrates an accident whose rarity is its chief claim to notice.

Author's Case.

A female, unmarried, aged 50, whom I saw in consultation on June 9th, 1922, gave the following history. At 8 P.M. on the 8th she slipped from a chair on which she was standing; she then stumbled into the edge of a washstand, striking her left side a blow of moderate severity. Immediately she suffered violent left-sided abdominal pain, and shortly afterwards vomited. Pain continued, and next morning she was seen by her doctor, who advised her removal to a nursing home for observation.

Condition on Examination.—I saw her at 8 P.M. on the 9th. Pulse had risen from 80 to 108; temperature 99·4° F.; she had vomited once, and had passed urine naturally several times since the accident; the urine contained scanty red blood cells. A typical abdominal facies. Abdomen not distended; no evidence of free fluid; extreme tenderness and rigidity on the left side; rest of abdomen appeared normal. Catheter specimen contained scanty red cells.

At 9 P.M. a general anæsthetic was administered, and as the rigidity disappeared a tumour became apparent. This was a swelling about the size of a fœtal head. It was fixed, its upper limit below the costal margin, its lower in the left iliac fossa. Its contour was rounded, and it did not extend into the loin. Colon resonance could not be made out. At this stage the clinical diagnosis was "injured ureter" and it was decided to open the abdomen because: (1) the swelling had not the character of a renal tumour; (2) peritoneal injury could not be excluded; (3) it offered the chance of determining the presence of another kidney.

Operation.—The abdomen was opened at the inner border of the left rectus abdominis. No free fluid found. Swelling lay to inner side of descending colon. Puncture showed its contents to be blood and urine. Right kidney appeared normal in size and position. Abdomen was closed, a small tube being used because of leakage at the puncture. Patient in right lateral semi-prone position. A nephrectomy was done through the oblique incision. The only difficulty was in distinguishing the collapsed sac from the descending colon. Tubes were removed in 48 hours. Healing was uneventful. No evidence of renal insufficiency appeared, and the patient left the home after three and a half weeks.

Specimen.—The specimen, now in the hands of the curator, Royal College of Surgeons of England Museum, is a thin-walled left hydronephrosis of congenital type. Ureter is kinked and narrowed at its junction with the pelvis. At the lower pole are two irregular radial tears about three-quarters of an inch long. A third tear at the hilum was produced during delivery of the kidney.

Cases Previously Reported.

Oehme,[1] of the Surgical Clinic, Tübingen, reports a case in detail, which was operated on by Prof. Hofmeister, and quotes the following[2]:—

1. Schetelig.—Patient "born with a big belly." Three attacks of pain and hæmaturia. Operation: Median incision, transperitoneal nephrectomy. Patient died 36 hours later. Post mortem: A large burst hydronephrosis.

2. Cantu.—Man of 65 fell from a tree, and felt a tearing sensation in the left side of the belly. A large fluctuating tumour appeared; he had fainting attacks and vomited; three days later he died. Post mortem: A burst hydronephrosis due to calculus.

3. Schede.—Woman, aged 26. Five days after a fall across a basket a large abdominal swelling diagnosed as a twisted ovarian cyst. Transperitoneal nephrectomy. Patient died; necropsy showed a large burst hydronephrosis.

4. Lampe.—A sailor, aged 16. Fell a distance of 20 feet into a ship's hold. Continued to work for one and a half days operation on the fifth day after his accident. Laparotomy and drainage. After operation he developed a large urinary fistula and wasted rapidly. Died 12 days after operation Post mortem: A tear in the lower pole of a large hydronephrosis.

5. Dodge.—A man of 35 received a blow on the left side with a cudgel. Three days later he was admitted to hospital There was a large fluctuating intra-abdominal tumour Laparotomy, transperitoneal nephrectomy; patient recovered. Specimen was a large hydronephrosis, with two ruptures in the pelvic portion.

6. Suter.—An apprentice of 16 fell, striking his lumbar region against the rungs of a ladder. Violent pain, sickness and hæmaturia followed. Bladder injury was suspected and a suprapubic incision was made. This was closed, and through a pararectus incision extending into the loin a large hydronephrosis which had ruptured into the peritoneum was removed. The patient recovered.

7. Gaudiani.—A young man, after lifting a heavy weight appeared to suffer from perityphlitis. At operation an old-ruptured hydronephrosis was revealed, and was removed. Recovery. This case might appear to come under the heading of spontaneous rupture, together with Prof. Brentano's two cases. There was, however, the definite history of trauma, and it appears that very slight violence may suffice to rupture one of these thin-walled sacs.

8. Rehn.—A child, aged 8, had had a swelling in the left side since birth. A fall across the edge of a box resulted in severe pain, vomiting, and hæmaturia. Bladder injury was at first suspected. A suprapubic incision was made, which was then closed. An incision in the side led to the discovery of a hydronephrosis as large as a child's head. Nephrectomy was performed, and the peritoneum, which was torn in one place, was repaired. Death followed three days later. In this specimen there was a tear at the upper pole, and the ureter was partly torn away from its junction with the pelvis.

9. Hofmeister's case was as follows. A man of 26 had enjoyed good health until one year before his second accident, when he was kicked in the scrotum by a horse. This injury incapacitated him for 14 days; but he suffered no urinary symptoms. From this date he noticed increasing swelling of his abdomen. In November, 1900, he was again kicked by a horse. The blow struck the left side of his abdomen. For a brief time he was unconscious. He vomited. Pain was severe and situated in the left side of the abdomen. He walked home, but had to rest several times during a 15 minutes' walk. Pulse 116; no hæmaturia; abdomen distended and tender; percussion note dull on left side. Twelve hours after his injury he was operated on. The left kidney was exposed through a lumbar incision. A blue tense cyst presented and 4½ litres of frothy blood-stained fluid was removed by tapping. There was a rupture of the upper pole involving the peritoneum. Nephrectomy and repair of the torn peritoneum was followed by recovery.

10. E. W. Johannsen.—In this case the rupture appears to have occurred twice to the same kidney. A youth of 17 was dragged along the ground by the tethers of some sheep. Severe abdominal pain followed, and he was operated on at Hammel Hospital six hours later. At this operation the sigmoid and its mesentery were tightly stretched across a tense retroperitoneal cyst, which contained serous fluid and was then thought to be a lymphatic cyst. Three and a half years later he was crushed between a horse and its stable. He was admitted to Viborg Hospital. There was marked dullness on the left side. At operation there were dense peritoneal adhesions and a retroperitoneal collection of fluid. Nephrectomy was performed. The patient recovered. It was noted that he was a cryptorchid with ill-developed penis; cystoscopy was for this reason impossible.

11. Anthony H. Harrigan.—A girl of 10 fell on the edge of a soap-box. She was in a fainting condition for an hour. For two days she vomited repeatedly and was then brought to hospital. Abdomen slightly distended and rigid. Urine contained neither albumin, casts, nor cells. Leucocyte count 31,000, 77 per cent. polymorphs. Laparotomy; abdomen contained blood but no gross lesion; cystic mass in left renal region; wound closed. Nephrectomy was then performed in the usual way. Recovery was marked by a transient renal insufficiency. On discharge, renal function, estimated by the phenol-sulphone-phthalein method, showed 20 per cent. first, 25 per cent. second, and 7·5 per cent. third hour.

In addition to the case first reported, and to these 11 quoted above, Prof. Adolf Brentano reports two cases of rupture of infected hydronephrosis.[3] Of these he makes the interesting observations: (1) Tendency to spread upwards simulating subphrenic abscess; (2) rupture into the fatty capsule caused a tumour which was mistaken for the kidney itself; (3) predominance of peritoneal symptoms and signs. Of these the first two do not appear to result from the traumatic rupture, whilst the latter does to a marked extent.

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The condition of traumatic rupture seems to be of such rarity that it is to be doubted whether conclusions drawn from a study of 12 cases can be of much practical value. It nevertheless presents points of interest from clinical, therapeutic, and pathological points of view.

Diagnosis.

Clinically, diagnosis appears to be essentially difficult. Should signs pointing to rupture of kidney especially if there be reason to suppose that the ureter be injured) supervene after an injury which seems too slight to be the cause of rupture of a normal kidney, the condition may be suspected. Apart from this, correct diagnosis would seem to depend on evidence pointing to pre-existing hydronephrosis. Such evidence existed in Cases 1, 8, 9; in the case detailed at the beginning of this article the only history that could be obtained before operation was that of indefinite indigestion. After the diagnosis had been made close questioning elicited a typical history of intermittent hydronephrosis. Even should a definite diagnosis of ruptured hydronephrosis be made the case is not complete. We require evidence of the function of the opposite kidney; we also require evidence excluding coincident abdominal njury. Cystoscopy should give the first; but it would seem that where there is any doubt a small abdominal incision will give greater certainty and afety.

From a study of reported cases, no case appears o have been correctly diagnosed before operation. n Case 11 a diagnosis of ruptured kidney was made fter laparotomy. In my own case the pre-operative diagnosis of injured ureter was shaken by the disovery that the tumour appeared to have no connexion with the usual site of a renal tumour; only after aparotomy was the seat of injury located with ertainty, and only when the collapsed kidney was being delivered was complete diagnosis arrived at. Unfortunately, these cases are urgent. Since renal njuries are, and should be, treated expectantly, they each the surgeon late; time and facilities do not llow of complete urological investigation. It thereore seems inevitable, in the present state of our nowledge, that a preliminary laparotomy should orm the prelude to exact diagnosis. Difficulty has risen because of the absence of any evidence pointing urely to renal injury. In Cases 9, 10, and 11, hich are clearly reported, it is noted that there was o hæmaturia. In Cases 1, 2, 3, 4, 5, and 7 this was ot recorded. Only in Cases 6 and 8 and in my own ase was hæmaturia definitely noted as a symptom. The rapid development of a swelling is not confined o urinary extravasations. The site of the swelling hould be a guide; but it seems that only in the ases where rupture is confined to the fatty capsule hat a renal tumour is mimicked; where the fatty apsule is torn spread at a distance is common Cases 3, 5, 7, and my own case). Percussion note was ull in two cases (9 and 10).

Ætiological Factors.

Though a thin-walled hydronephrosis may be uptured by very slight violence it by no means ollows that patients with hydronephrosis are less ubject to the severer forms of violence. It seems est to classify three grades of violence: (1) Very ight—such as would be expected to produce no njury in a normal subject (Case 7, doubtful);) slight—such as might be expected to produce ight external bruising, but no incapacity, in a normal subject (Cases 3, 5, 6, 8, 10, 11, and my own case); (3) severe—second rupture (Cases 2, 4, 9, and 10). With regard to evidence pointing in the direction of congenital deformity, since the bulk of the cases of hydronephrosis seem to be due to imperfect development, in this series, Cases 1, 8, 10, 11, and my own case were certainly, and Cases 3, 4, 5, and 6 probably, of this nature. Such evidence may be classed as (*a*) general—club-foot, hare-lip, polydactylism, &c.; and (*b*) genito-urinary—herniæ, undescended testis, epi- and hypo-spadias.

Pathology.

Rupture in these cases lends support to Kuster's views on the mode of rupture of normal kidneys. The rupture is radial, and appears to indicate a burst rather than a break, or crush. Coincident tearing of the peritoneum is noted in Cases 6, 8, and 9. Such a high proportion—25 per cent.—is a strong argument in favour of a preliminary laparotomy for diagnosis; although in all three cases this appears to have been noted and repaired. There is, however, little doubt that an abdominal incision, in addition to its previously discussed advantages, gives a better chance of removing any soiling with urine or with blood-clot, as in Harrigan's case.

Therapeutics.

Nephrectomy is the operation of choice. No form of repair can be expected to hold under the pressure proximal to ureteric obstruction. Plastic operations on the renal pelvis call for careful planning and aseptic conditions. Should there be evidence of bilateral hydronephrosis and renal insufficiency a nephrostomy pending more complete investigation of the urinary functions would seem indicated. The condition has had a high mortality; of the 12 collected cases 5 died (41 per cent.), but the more recent cases of the series show a greatly improving record.

Medical Societies.

MEDICAL SOCIETY FOR THE STUDY OF VENEREAL DISEASES.

THE second annual meeting of the Society was held on Friday, July 20th, under the new President, Colonel L. W. HARRISON, R.A.M.C. (retd.)

Mr. FRANK KIDD read a paper entitled "Vasostomy for Chronic Seminal Vesiculitis (a New Technique)." (The paper will be found in full on p. 213.)

The PRESIDENT expressed the thanks of the Society for this contribution, remarking that all who had to do with these difficult cases would agree that they were the bugbear of the worker in the field of venereal diseases.

Dr. DAVID WATSON said he had been discouraged from doing the operation described by reading an account of some experimental work which was done in America. The difficulty of that worker was to find an efficient gonococcocide which yet should not damage the tissues of the vas. After hearing this minute description of the operation and the results Mr. Kidd had secured, he intended to try it in future suitable cases. He would particularly like the same make of cannula as Mr. Kidd used. With regard to the use of colloidal silver, some doubt had been thrown on the use of colloids, and with those doubts he felt some sympathy. His use of colloidal silver in gonorrhœa had not been so happy as Mr. Kidd's. He could not agree that the behaviour of gonococcal retinitis or iritis after treatment placed it in a category different from that of arthritis; he had found the iritis clear up as readily as the joint trouble. He could only remember one case in which non-operative treatment failed to clear up the chronic vesiculitis; probably, however, the operation now described cleared up the condition in a much shorter time.

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[3] Brentano, A.: Zeit. f. Urologie, 1912, vi., 713.

Mr. F. F. **Ward** said he believed his failures in this condition had been due to the fact that he had washed out once only. He described one or two cases in which trouble ensued. The cannula he had been using was a lacrymal duct cannula. If at the injection of colloidal silver the patient complained of pain, that was an indication that the substance was actually in the vas. He would like to know whether the operation could be done in a fairly recent and acute case. He thought the operation was applicable far more often to cases which suffered from gonorrhœal arthritis.

Dr. **Dennis Vinrace** said it was inadvisable to tell a patient with gonorrhœa that he was cured; a safer plan was to tell him to come for a further inspection after an interval; and if at the further interview his prostate was found to be enlarged, or his vesicles inflamed, he should be advised to have an operation. He hoped this operation would become a popular one, and that after the detailed description had been published more workers in venereal diseases would carry it out.

Mr. **Kidd**, in reply, said his object in bringing the communication forward was to popularise the operation. He had now been working at the matter for ten years, arriving at the present position after experiencing many difficulties. It was easy to cause the vas to slough if it were hung up; it was a simple procedure to ligature it. When operating on the bladder he often ligatured the vas, and nothing happened to the testicle. He hoped that those who essayed the operation would perform it on chronic cases, and follow his description of the operation in every detail. The colloidal silver he was using was one made specially for him at the Crookes Laboratory, and it was the best material for the purpose. Sometimes he used it in a 10 per cent. strength, very rarely indeed 20 per cent. His cannulas were made by Mr. J. H. Montague; it was essential to keep the wire in, otherwise there would be leakage into the needle, blocking it. He still emphasised the fact that there was a liability for iritis to recur after an interval of even years, and this was not the case with joint trouble after it had once been disposed of.

Reviews and Notices of Books.

CEREBRO-SPINAL FLUID IN HEALTH AND DISEASE.

By **Abraham Levinson**, B.S., M.D., Associate in Pediatrics, Northwestern Medical School. London: Henry Kimpton. 1923. Pp. 267. 25*s.*

Dr. Levinson's book is already known in this country. In this, the second edition, he has added a good deal of new matter and brought the whole up to date. The result is a useful and thoroughly practical manual. Indeed, the author has rather tended to omit theoretical considerations in places where they might with advantage have been included. This is particularly the case when he deals with the newer diagnostic procedures, such as the colloidal gold and mastic reactions, depending upon alterations in the physical properties of the proteins of the cerebro-spinal fluid. His descriptions of the uses and interpretations of these tests is excellent, and his account of the technique quite sufficient to enable an intelligent worker to carry them out; he barely touches, however, upon the much-discussed mechanism of these phenomena.

A description of the technique of cistern puncture is given, and here the author might have gone more into detail. His advice is that no one should practise it without frequent preliminary trials on the dead body, and to do this avails more than the reading of scores of pages of instructions. No mention is made of the washing out of the spinal theca through needles inserted in the cervical and lumbar regions. Certainly the value of this procedure is doubtful, and it may be questioned whether it is ever justifiable, but it is for advice and information on just such points as this that the reader goes to books like Dr. Levinson's.

Froin's syndrome comes in for rather casual mention. To imply that it consists only in xanthochromasia and increased protein and cell content of the cerebro-spinal fluid is hardly to do justice to its originator. It is the presence of these phenomena in the fluid from one portion of the theca in conjunction with normal or more or less normal fluid higher up that constitutes the full syndrome; in practice, we admit, the presence of the normal fluid higher up is frequently taken for granted. The section on the anatomy of the ventricular systems and of the meninges is lucid and the illustrations good. The historical summary is excellent and makes interesting reading. A good many of the illustrations are unnecessary. Microphotographs of tubercle and other bacilli are not of much use to the sort of readers who are likely to resort to Dr. Levinson's pages, nor in fact to any one. It may be taken as axiomatic that even as in the dusk all cats are grey so in microphotographs all bacilli are alike.

BACTERIOLOGICAL DIAGNOSIS.

Leitfaden für die klinisch-bakteriologischen Kulturmethoden. Von Dr. **Hugo Schottmüller**, Professor und Direktor der medizinischen Poliklinik der Universität Hamburg. Berlin und Wien: Urban und Schwarzenberg. 1923. Pp. 96.

This handbook is intended as a guide to bacteriological diagnosis in a well-appointed clinical laboratory. The subject-matter dealt with is therefore rather restricted, and the greater part of the information which it contains is also to be found in more complete works on bacteriology. The methods which are recommended are well described, and they derive interest from the fact that they have been selected by one who has had large practical experience in the subject and has himself devised some of the technique. Sixty-eight of the 91 pages are devoted to blood culture, and both in this section and elsewhere especial attention is given to the streptococci, as is natural considering the association of Schottmüller's name with work on this group of bacteria. Some of the statements are more suggestive of finality in streptococcal classification than will be accepted as they stand by most other bacteriologists. For the "typhoid-coli" group of organisms the methods of diagnosis are, in accordance with German custom, rather unnecessarily complicated, especially as regards the use of various whey and nutrose media, which in this country are usually regarded as quite superfluous for routine diagnostic work. The simple and entirely satisfactory MacConkey's lactose bile-salt agar, on the other hand, is not mentioned. The omission of dulcitol, which is so useful in culture-media for the identification of the salmonella group, seems strange in a book written by the original sponsor of the paratyphoid bacilli. The book is very well and clearly printed, and contains a good index but very few references.

Mikromethodik: Quantitative Bestimmung der Harn- und Blutbestandteile in kleinen Mengen. Zweite Auflage. Von Dr. med. et phil. Ludwig Pincussen, Direktor der Biochemischen Abteilung des Städt Krankenhaus am Urban zu Berlin. Leipzig: Georg Thieme. 1923. S. 125. M.18.

In this book, in the compass of 125 pages, the author brings together many of the more recently described micro-methods for quantitative investigation of the blood and also micro-methods worked out by himself for the estimation of the constituents of the urine. Micro-methods involving for the patient only a prick with a needle are of obvious advantage in dealing with the blood; in the case of the urine, however, their advantages hardly appear to outweigh their disadvantages; the use of only 0·1 c.cm. of urine for estimation of the nitrogen by a micro-Kjeldahl method and of 1 c.cm. for estimation of the chlorides by a micro-Volhard method seem rather in the nature of a tour de force, when dealing with such easily obtainable material. The disadvantages inherent in all quantitative micro-methods are by no means minimised by the author, and all who contemplate following his technique will do well to study carefully his "allgemeine Regeln" (p. 7). The methods of blood investigation are excellently chosen; they include procedures, mostly of proved value, for the estimation of practically all the constituents of the blood, including the gases, and also the method recently described by Michaelis for the estimation of the pH of serum and other fluids. The descriptions of technique throughout are models of clarity and conciseness.

THE ANATOMY OF THE FEMALE PELVIS.

By F. A. MAGUIRE, D.S.O., M.B., Ch.M. Syd., F.R.C.S. Eng., Hon. Assistant Gynæcological Surgeon, Royal Prince Alfred Hospital, Sydney. Sydney: Angus and Robertson, Ltd. 1922. Pp. 115. 6*s*.

THIS little book is written by a clinician for clinicians, though its author is also a teacher of anatomy in the University. It gives the main facts of female pelvic anatomy shortly and clearly, and goes on to the examination of the organs during life, from the anatomical point of view. Its small size and easy arrangement will render it a serviceable book of reference for those who may find their knowledge of the parts at fault when dealing with some condition of disease in these regions.

A MANUAL OF HUMAN ANATOMY FOR DENTAL STUDENTS.

By R. BRAMBLE GREEN, M.B., B.S. Lond., F.R.C.S. Eng. London: Benn Brothers, Ltd. 1923. Pp. 263. 18*s*.

THIS is a very good book on descriptive anatomy suitable for students of dentistry. It is divided into two parts, the first giving clear accounts of general anatomy, and of the skeleton and systems throughout the body in general. The second part is devoted to the regional anatomy of the head and neck. It is not a manual of dissection, but appears to sum up, in an intelligible and short way, all that it would seem necessary for the students to know. There is no attempt to deal with the teeth, on which there are special handbooks. The information contained in the book appears to be thoroughly reliable, except that in one place the author seems to suggest that the palatoglossus owes its innervation to the twelfth cranial nerve, on which point some might differ from him. The volume is well produced and printed in clear type, with useful illustrations.

BOOKS FOR NURSES.

Surgical Nursing and After-Treatment. Second edition. By H. C. RUTHERFORD DARLING, M.D., M.S. Lond., F.R.C.S. Eng., F.R.F.P.S. Glasg., Surgeon, Coast Hospital, Sydney, N.S.W.; Demonstrator of Anatomy, Sydney University. London: J. and A. Churchill. 1923. Pp. 566. 8*s*. 6*d*.

IN this portable volume Mr. Darling has condensed admirably all the knowledge that a nurse is expected to possess when called upon to undertake a surgical case. Given the practical experience that can only be obtained at the bedside, any nurse who knew all that this book contains would be able to undertake the nursing care of any surgical patient. Each chapter is preceded by a synopsis of its contents, which are then presented in a lucid and readable form. A number of illustrations add to the attractiveness of the book. It is divided into sections—namely, "General Surgical Nursing" and "Regional Surgical Nursing." In the first section short accounts are given of the pathology, symptoms, and treatment of the general surgical conditions commonly met with, including a glimpse into bacteriology and immunity. The general principles of asepsis, the arrangement of an operating theatre in hospital and in private practice, the treatment of hæmorrhage, infections, and fractures are dealt with adequately. It must be remembered that the book was written in Australia for Australian nurses, and that references to the South as an ideal aspect for an operating theatre must be translated into North for our latitude. The second section on regional surgery describes the preparation of the patient, the requirements of the surgeon, and the special after-treatment necessary for operations on the various organs of the body. A number of the modern improvements introduced during and since the war are included, and the book is thoroughly up to date. We hope that the book will meet with the success which is its due.

The Nursing of Infectious Diseases. Third edition. By F. J. WOOLLACOTT, M.A., M.D., B.Ch. Oxon., D.P.H. London: The Scientific Press, Limited. Pp. 180. 4*s*.

THIS book, based on a course of lectures to nurses given by Dr. F. J. Woollacott, has been revised and brought up to date by Dr. Dorothy C. Hare. The chief additions relate to methods of investigation of infectious diseases both for diagnosis and infectivity, chapters on cerebro-spinal fever, tuberculosis, and venereal diseases having also been included. The subject of infection and the prevention and general management of infectious diseases is briefly but adequately discussed in the first three chapters of the book, after which follows a description of the chief infectious diseases of this country. Excellent judgment has everywhere been shown in the selection of points for discussion, and although it is assumed throughout that the reader has some acquaintance with the general principles of nursing, nothing relating specifically to the nursing of infectious diseases has been taken for granted. Some of the teaching given would hardly be endorsed by leading authorities at the present day.

In discussing the various plans adopted for preventing cross-infection the principles of barrier-nursing and bed isolation are described, but enough emphasis is hardly laid upon the fact that with the slightest neglect or carelessness on the part of a single nurse the whole system breaks down in that particular institution. Indeed, the experience of most authorities goes to show that even with the utmost care in technique bed isolation is not safe for measles or chicken-pox, or even, in Dr. W. Goodall's view, for severe cases of scarlet fever, diphtheria, or whooping-cough during the acute stage of the disease. These are small points, however; the book as a whole is admirably adapted for its purpose, and the new edition will be welcomed by nurses.

Text-book of Anatomy and Physiology. For Training Schools and other Educational Institutions. By ELIZABETH R. BUNDY, M.D. Fifth edition, revised and enlarged by MARTHA TRACY, M.D., Dr.P.H., and GRACE WATSON, R.N. London: J. and A. Churchill. 1923. Pp. 442. 11*s*. 6*d*.

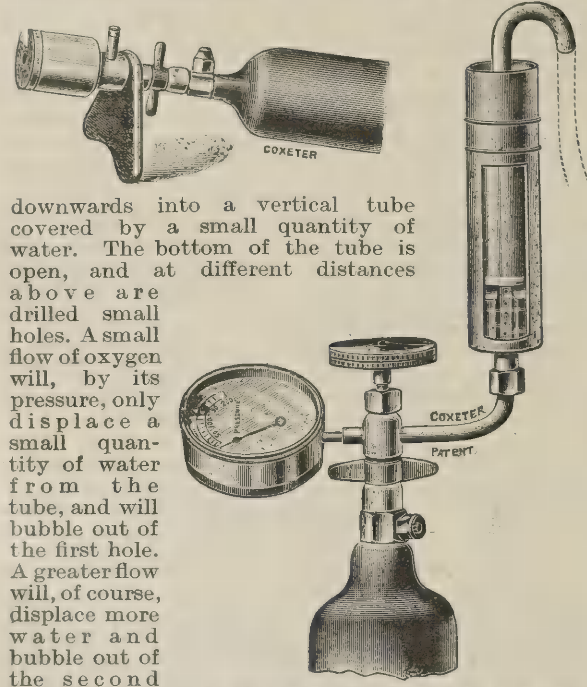
THIS little book was written as a text-book for those who were training for recognition as nurses, and includes an account of the human body from anatomical and physiological standpoints. The difficulty of producing enough and not too much, in writing for readers of this sort, is known to everyone who has attempted the task, and it is easy to be over-critical when dealing with the efforts of others. We can only claim, then, to express an individual opinion when we say that such things as the treatment of the palate bone as a separate entity, or the mention of nutrient foramina, however brief they may be, seem to be unnecessary; we rather think that, for nurses, certain parts and functions of the body might be treated with much more detail than is usually afforded, while of the rest some might be sketched in with broad outlines and others omitted altogether. The writers of this book do not see things in quite the same way, however, and the fact that the work has reached its fifth edition is perhaps sufficient justification for their faith.

To assist the authors in preparing the sixth edition we may note the following points. Fig. 79 has a mistaken label for the rectus ; the nerve supplies of buccinator, diaphragm, and one or two others would bear a little revision ; such things as the rotating action of the psoas and the origin of the small pectoral muscle might also be reconsidered ; it might, moreover, be well to harmonise the conception of the meaning of eversion and inversion of the foot with that more usually accepted. The work is well and clearly printed and produced, and is copiously illustrated, with many coloured figures.

New Inventions.

NEW PATTERN OXYGEN SIGHT-FEED VALVE.

THE illustrations show how, by means of a single piece of apparatus, the supply of oxygen to patients can easily be regulated and waste obviated. The tube and funnel method is not only wasteful but often defeats the object of its use, as usually the blood becomes saturated with oxygen, the H-ion concentration is decreased, and consequently the respiratory centre receives less stimulation than before, and the patient breathes more shallowly than ever. Oxygen should be given in such a way that it enriches, but does not displace, the air the patient breathes. This can be achieved most economically by means of the apparatus described herewith, the oxygen passing downwards into a vertical tube covered by a small quantity of water. The bottom of the tube is open, and at different distances above are drilled small holes. A small flow of oxygen will, by its pressure, only displace a small quantity of water from the tube, and will bubble out of the first hole. A greater flow will, of course, displace more water and bubble out of the second hole, and so on. In this way the physician can order the nurse to give the patient two, three, or four holes of oxygen as the case may be, instead of vaguely ordering the administration of oxygen. In order that the patient should get the full benefit of the small quantity of oxygen required, a nozzle is attached to the rubber tube, and by means of a spring clip in connexion with it, the nozzle can be fastened to the bedclothes in such a position that the flow of gas is directed towards the patient's nostrils or mouth, and as near as may be necessary, thus achieving the desired object of enriching the air the patient breathes.

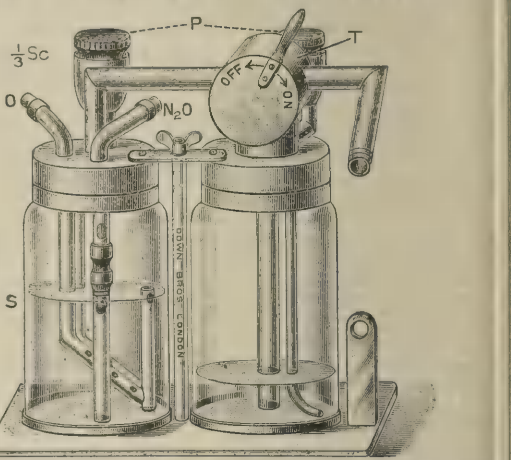


The apparatus is supplied in two forms by Messrs. Coxeter and Son, 171, Pancras-road, London, N.W. 1, one for use with upright cylinders and another for use with horizontal ones. In one form the apparatus consists of a pressure gauge and sight feed in one, ready for screwing into the cylinders, the gauge enabling one to see at a glance how much oxygen is available and the control of the gas taking place at the cylinder valve. In the second form an automatic pressure-reducing valve is provided for screwing into the cylinder, to which is connected, by a rubber tube, the sight feed part which is hung at the head of the bed, and the flow of the gas is controlled by a fine adjustment valve attached thereto, instead of on the cylinder.

F. P. DE CAUX, L.R.C.P. Lond., M.R.C.S.

AN APPARATUS FOR THE ADMINISTRATION OF NITROUS OXIDE, OXYGEN, AND ETHER.

THE apparatus here illustrated consists of two 8 oz. bottles fitted with screw tops and mounted on a metal base. The N_2O inlet to the water sight feed bottle (S) is made partly of metal and partly of glass, the metal part having a hole above the water-level equal to the calibre of the tube itself. When the N_2O is turned on the level of the water in the glass tube is depressed, such level indicating regularity of flow. A depression of ¾ in. represents approximately a flow of 120 gallons of N_2O per hour. The oblique construction of the oxygen tube (O) enables the bubbles to be plainly seen, and permits at the same time of a rapid and considerable increase in the volume of the oxygen without the risk of water being driven out of the bottle. Two " holes " of oxygen with a depression of ¾ in. in the N_2O tube represents 10 per cent. of oxygen. Both gases can be easily varied according to the requirements of the patient, and delivered under positive pressure if desired. The mixed gases can be diverted through ether, or C.E. mixture if preferred, by means of the two-way stop-cock (T). The bottles can be filled or emptied through the plugs (P) without unscrewing the tops. On the assumption that a table of some kind is usually available for the anæsthetist, an elaborate stand or carrying case has been omitted from the design. The cylinders are mounted with fly nuts on a horizontal metal bar which is provided with two detachable legs. Long lever keys are used and the gas valves heated with a spirit lamp. Used in conjunction with a portable tracheal insufflation apparatus already described by me in THE LANCET,[1] and to which this unit can be easily attached, N_2O, oxygen, chloroform, and ether can be given by inhalation or insufflation as desired.



The original model of this apparatus was made for me by Messrs. Coxeter and Co., and the improved pattern by Messrs. Down Bros., St. Thomas's-street, S.E. 1.

I. W. MAGILL, M.B., B.Ch., B.A.O. Belf.,
Senior Anæsthetist, Queen's Hospital, Sidcup.

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[1] THE LANCET, 1921, i., 918.

BRITISH MEDICAL ASSOCIATION.

ANNUAL MEETING AT PORTSMOUTH.

(*Continued from p. 190.*)

REPRESENTATIVE MEETING.

MONDAY, JULY 23RD.

Financial Statement.

THE session opened with a financial statement by the Treasurer, Dr. G. E. HASLIP, for the year ending Dec. 31st, 1922. The income for this year amounted to £112,141, the expenditure to £102,337, with a surplus of £9804. The revenue from subscriptions amounted to £2 11*s.* 9*d.* per head of membership, which had been allotted as follows :—

	£	*s.*	*d.*
Central Association expenses	0	2	10
Central meeting expenses	0	8	4
Central premises expenses	0	3	8
Central printing, stationery and postage account ..	0	2	2
Central staff expenses	0	11	3
Library account	0	0	8
Journal account	0	7	3
Grant to Irish Committee	0	0	10
Grant to Scottish Committee	0	1	7
Capitation grants to branches	0	4	5
Subscriptions written off for deaths and in arrears ..	0	2	3
Depreciation, &c.	0	1	8
Surplus (part)	0	4	10
	£2	11	9

In pursuance of a decision of the Glasgow meeting, a separate reserve fund had been created, which now stood at £27,247, being entirely represented by first-class securities readily realisable. The combined reserve fund and surplus account amounted to £152,142. Expenditure, Dr. Haslip said, continued to increase year by year, and although a motion by Hastings invited the meeting to "view with alarm and regret" the continuous increase of central staff expenses, the meeting emphatically signified its approval. Dr. J. D'EWART made good the point that an Association which did not pay its own office staff properly could not go to the Government with a valid plea for an adequate capitation fee. A motion to reduce the annual subscription was withdrawn and a motion to reconsider it was lost.

Insurance of Editorial Staff against Libel.

A motion by Wandsworth and Blyth proposed that the Association would feel safer if it were protected by insurance against process for libel or slander against any of the editorial staff. Dr. HASLIP preferred to leave the responsibility on those who acted for the Association, asking what the effect on a jury would be of a question from counsel : "Is it a fact that your Association is insured against libel actions ?" Dr. BOLAM thought that the proposal would involve insurance of every activity of the Association ; the right remedy lay, he said, in "the care with which we order our actions." The motion was lost by a large majority.

Medical Benevolence.

The Treasurer alluded in his financial statement to the meagre contribution of members of the Association to medical benevolence ; the Royal Medical Benevolent Fund had only benefited during the year to the extent of £837 (out of a subscription total of some £60,000). It was a lamentable fact that a mere 10 per cent. of the medical profession in the country and only 7 per cent. in London subscribed to the Fund. There was, however, this to be said : the medical charities offered no encouragement to the Association to assist them—and he gave specific examples of lost opportunities. The B.M.A., if asked for their help, could, said Dr. Haslip, easily double or treble the subscription list to the R.M.B.F. The meeting acquiesced in the statement that "the charitable funds are a disgrace to our profession," and left it at that.

The Association's New Home.

The Chairman of the B.M.A. Council and the Treasurer then reported briefly on the arrangements made to acquire new premises in Tavistock-square for the headquarters of the Association, figures being given of the accommodation in the new building and of the financial transactions in connexion with the purchase. Dr. BOLAM said that the building, designed by Sir Edwin Lutyens, and originally intended for a theosophical college, was during the war taken over for Government purposes, and came into the hands of the Disposals Board. The building as it existed would provide scope for all present activities ; it contained a really noble hall which would hold the largest meeting the Association was ever likely to require, and more space for social purposes could be obtained by the acquirement of certain houses fronting on Tavistock-place. Dr. HASLIP, who described the new house as a "gift from the gods," showed in detail how the cost of acquiring the premises on a 200 years' lease could be met. Much enthusiasm prevailed in the meeting for the new venture. The CHAIRMAN broke his self-imposed silence to speak feelingly on the great opportunity afforded for the social work of the Association. Dr. J. A. MACDONALD congratulated the Council on their prescience and good skill in negotiation. Mr. BISHOP HARMAN suggested a Gate of Honour in memory of members who fell in the war. The suggestion was made, situated as it was in the neighbourhood of the new University of London, the house might become a centre of intellectual life and of organised post-graduate medical work in London.

Organisation of Colliery Surgeons.

As Chairman of the Medico-Political and Parliamentary Committee, Mr. E. B. TURNER proposed the adoption of a scheme for the organisation of colliery surgeons in England, suggesting the formation of special colliery and works surgeons' committees to deal with the domiciliary attendance upon persons on a contract basis, the Council of the B.M.A. to be the executive committee, and every surgeon in the area paying a special subscription of 5*s.* per annum towards expenses. The scheme upholds the principle of free choice of doctor and freedom from lay control, the method of payment to be left to local arrangement, contributions, where possible, being deducted at the colliery or works' office. This scheme was accepted after a brief discussion.

Medical Examination of Emigrants.

A recommendation by the Council that the fees chargeable by the medical referees appointed by the Dominions of the Empire to examine proposed emigrants should be 10*s.* 6*d.* per adult of the age of 16 years and over, and 2*s.* 6*d.* for each child, but that in no case should more than two children in each family be charged for, was accepted by the meeting.

State Recognition of Opticians.

A further recommendation by the Council in regard to opticians was accepted in the form :

> That any State recognition of sight testing by persons not possessed of a medical qualification would not be in the interest of the community, and ought to be opposed in the strongest possible manner, and that the Council be instructed to take action in accordance with this decision.

Fees at School and Child Welfare Clinics.

It was proposed by the Chairman of the Medico-Political and Parliamentary Committee that the following minimum fees for the treatment of school children and for treatment at maternity and child welfare clinics or centres by private practitioners be approved :—

1. For the treatment of minor ailments, £1 11*s.* 6*d.* per session of not more than two hours, provided there is a limitation, to be agreed locally, of the average number of new cases to be seen in each session.
2. For ophthalmic work involving refractions, 10*s.* 6*d.* per case, or £2 12*s.* 6*d.* per session of not more than two hours, provided there is a limitation, to be agreed locally, of the average number of new cases to be seen in each session.
3. For adenoid and tonsil operations involving a general anæsthetic, a total fee for the two practitioners concerned of £1 11*s.* 6*d.* per case for less than four cases ; or £5 5*s.* per session at which the average number of cases per session to be dealt with is agreed locally, such agreed number to be not more than eight.
4. For other operations on eye, nose, ear and throat cases a fee specially arranged in each case.

5. For the administration of anæsthetics, £2 12*s.* 6*d.* per session of not more than two hours, provided there is a limitation, to be agreed locally, of the average number of cases to be dealt with in each session.

6. For X ray treatment of ringworm, £3 3*s.* per completed case where the practitioner provides his own apparatus, or £2 2*s.* where the apparatus is provided by the local authority.

7. All the foregoing fees to be exclusive of any fee paid to institutions for maintenance or other attendance on patients.

8. Any local arrangement in terms varying from the above to be submitted to the Council for approval before being adopted.

After some discussion on the combined fee for tonsil operations the motion was carried.

Salaries of Part-time V.D. Appointments.

The scale of remuneration for part-time senior medical officers of clinics set up by the Representative Meeting of 1917, under schemes for the diagnosis and treatment of venereal diseases, was rescinded in favour of the following policy :—

That the minimum remuneration for part-time senior medical officers of clinics set up for the diagnosis and treatment of venereal diseases be £1 1*s.* for the first hour or part of an hour and 10*s.* 6*d.* for every additional half-hour or part thereof.

Municipal Clinics and Hospitals.

Endorsement was given by the meeting to the recommendations of a committee appointed to consider the general question of the relation of private practitioners to municipal clinics and hospitals, the following principles being laid down :—

The object of maternity and child welfare centres should be educational and advisory, and therefore preventive. No medical treatment should be given at the centre as it is against the best interests of the centres to encourage women to go there for what they can *get* rather than for what they can *learn.*

When the expectant or nursing mother or the child requires any medical treatment, the procedure outlined under medical treatment of school children should be followed. This would limit the patients to those who are unable to provide a family doctor for themselves or for their infants. Where treatment has to be provided by the local authority at a clinic, it should preferably be undertaken at the common clinic for all statutory purposes.

There may be advantages to the work in associating with the centres a body of voluntary workers, but the whole of the work should be under the control of the medical officer of health in order that all the preventive agencies may be coördinated.

The support of the local doctors, nurses and midwives ought to be secured. To effect this it is important (*a*) that it be made quite clear that the sphere of the centres is restricted as recommended above, and (*b*) that members of these professions be represented on the statutory committee and the committees controlling the centres, these representatives being nominated by the local organisations of these professions wherever such exist.

Medical Treatment of School Children.

The procedure mentioned above was laid down by the Association in 1916 as follows :—

(*a*) The medical treatment of school children is a great national undertaking, the ultimate success of which largely depends upon the number of persons who are interested. From this point of view it is better that as many as possible of the medical profession should have personal contact with the work, rather than that familiarity with it should be confined to a small class of public officials.

(*b*) Medical practitioners who are engaged in private practice enjoy the benefit of a wider experience of the treatment of disease in general than those whose work is confined to the treatment (or the treatment and inspection) of school children.

(*c*) Treatment and recurrent supervision of the school children by such practitioners, supplemented by the "following up" work of the school medical officer, in the opinion of the Association alone give security that the medical needs of the children will be adequately met.

(*d*) The treatment of diseases of children gives those who carry it out opportunities of obtaining valuable experience. If the work is done by private practitioners who are engaged, apart from their school work, in treating members of the general public, the general public derives great benefit from the greater efficiency of private practitioners generally.

(*e*) The employment of private practitioners gives the education authority a much wider field of choice than if the work is carried out by whole-time officers, and by the employment of part-time officers the authority would be able to adjust the appointment of persons of special skill to its requirements.

Midwives and Use of Opium and Pituitrin.

The meeting renewed the protest contained in the following resolution passed in 1922 :—

That this meeting is of opinion that the practice of the use by midwives of opium (as well as of pituitary extract) is fraught with considerable danger, and considers that a continued protest should be made against such use.

Representations made to the Central Midwives Board and the Ministry of Health had evoked a statement from both bodies that there was no evidence that any harm had resulted from the use of opium by midwives. With regard to the use of pituitary extract by midwives, the Minister of Health recognised that this was a drug which should only be used by a midwife under the direction of a doctor.

Notification of Convictions to the G.M.C.

As the result of an emphatic letter to *The Lancet* and *British Medical Journal* of July 1st, 1922, in which Dr. J. M. Brennan, J.P., stated that he was not satisfied that trivial offences rightly came under the jurisdiction of the General Medical Council, the B.M.A. Council went into the matter and ascertained :

(*a*) That no similar system of notification of convictions of solicitors or barristers exists, although in a serious case coming before the courts affecting a barrister, the matter may be dealt with by the Benchers of his Inn of Court, and (*b*) that the procedure in the case of medical practitioners arose in the following manner : (i.) that in 1892 the Home Office was asked to report to the G.M.C. all convictions for felony ; (ii.) that in 1906 the Home Office was asked to notify all cases in which fines were inflicted, as well as those in which registered practitioners were ordered to be imprisoned ; (iii.) that in 1912, in consequence of certain matters which came under its notice, the G.M.C. requested that all convictions of practitioners might be reported to it, in order that it might be in a position to fulfil the duty laid upon it by Section 29 of the Medical Act, 1858 ; and (iv.) that the jurisdiction of the G.M.C. which empowers them "if they see fit" to erase, follows upon the fact of conviction ; it is not conditioned by the receipt of an official or other report.

These being the facts, the B.M.A. Council nevertheless satisfied itself that although the system was not free from theoretical objection, there was no evidence of hardship having arisen from the procedure.

Two amendments were offered to the meeting asking that the procedure should be further scrutinised. A representative of Marylebone complained that it was a hardship for medical men to be reported for trivial offences. Dr. F. G. RALPHS, J.P., thought it unnecessary to notify to the G.M.C. convictions such as for driving inadvertently without lights, and suggested making a distinction between summary (e.g., drunkenness) and indictable offences. Dr. D. A. SHEAHAN desired that doctors should be treated like barristers and solicitors, and not like children.

Sir JENNER VERRALL saw the difficulty of drawing the line anywhere. A medical man convicted of drunkenness in the course of his work should be reported ; the case of barrister or solicitor was not parallel. Mr. TURNER stated that no proceedings would be taken on the information in any one of the small cases ; for drunkenness it was only on a third notice that a warning was issued, and on a further repetition the offender was placed on probation for a year. But he felt strongly that it should not be left to the discretion of magistrates' clerks and chief constables which cases should be notified to the G.M.C.

The amendments were lost and the report of the B.M.A. Council accepted.

Medico-Legal Matters.

A resolution by Dr. CHRISTINE MURRELL instructing the B.M.A. Council to consider the desirability of publishing a Legal Handbook for Medical Practitioners was rejected, the feeling being general that the proposal would be difficult and costly to carry out ; while the advice needed by the practitioner could be obtained when the need arose. The Association had no desire to enter into competition with any of the existing text-books of legal medicine.

A motion proposed by Dr. S. NOY SCOTT (Plymouth) seconded by Dr. A. TENNYSON SMITH (Bromley), and carried, emphasised the desirability that medical men called as witnesses in legal cases (especially under the Workmen's Compensation Act) should consult with each other before the case is heard so that they may, if possible, agree upon facts.

Election of Eight Members of Council.

The deputy medical secretary announced that the voting for the eight members of Council for the session 1923–24 had resulted in the election of the following: Dr. H. G. Dain, Dr. E. R. Fothergill, Dr. R. L. Langdon-Down, Dr. J. A. Macdonald, Dr. G. W. Miller, Dr. C. Sanders, Mr. H. S. Souttar, and Mr. E. B. Turner. The election was conducted on the single transferable vote principle, and a woman member was nominated but not elected.

Nursing at Cottage Hospitals.

Dr. J. MCGREGOR-ROBERTSON raised the question of the position of nurses in cottage hospitals not recognised as training centres by the General Nursing Council. The B.M.A. Council felt that it would be in the interests of the public and of the nurses themselves if the training in such hospitals were allowed to count in some proportion at least towards the statutory three years' training. Dr. E. J. TOYE said it was a matter of life and death for cottage hospitals, for directly the nurses found out that such training and experience did not count towards obtaining the diploma they resigned.

Naval and Military.

The report of the B.M.A. Council under this heading was accepted and Colonel C. B. Heald, Major-General Sir William Macpherson, and Colonel Sir Walter J. Buchanan were appointed to the Council to represent the medical services of the R.A.F., A.M.S., and I.M.S. respectively. Sir Percy Bassett-Smith continues to represent the R.N.M.S. The B.M.A. Council had endeavoured unavailingly to reopen the question of the position of senior surgeon commanders, adversely affected by the 1919 regulations, and the meeting agreed that recently qualified medical practitioners should still be advised seriously to consider the disadvantages to which they are liable if they place their careers in the hands of the Admiralty.

Scotland and Ireland.

Reports were presented by Dr. JOHN STEVENS, chairman of the Scottish Committee, and by the chairman of the Irish Committee, and were approved. Dr. Stevens reported progress regarding the inquiries (1) into the results of gastro-enterostomy and gastrectomy, and (2) into puerperal sepsis.

TUESDAY, JULY 24TH.

Overseas Branches.

Sir JENNER VERRALL, in the absence of Mr. T. P. Dunhill, moved the approval of this section of the annual report. The position of salaried officers in the Windward Isles remained most unsatisfactory, the medical services of the West Indies being the worst-paid of all the Colonial services, or, indeed, of any services over which the Crown had any control. The Colonial Office took the view that the financial difficulties of the West Indian Governments rendered the prospect of increased salaries unlikely in the extreme. Dr. JOHN HUTSON (Barbados), in thanking the Association for their work on behalf of the West Indian branch, pointed out that this reply of the Colonial Office was, unfortunately, perfectly true. Dr. G. B. MASON (Grenada) also agreed that the Government could not at present help the doctors. In regard to drastic action, he reminded the meeting that refusal of British doctors to go out to the islands would open the door to the employment of American doctors. Dr. E. P. BAUMANN (Witwatersrand) brought an assurance of goodwill from the South African members at a critical stage in the negotiations regarding a separate medical association.

Non-Panel Practitioners.

Dr. C. BUTTAR, chairman of the Non-Panel Committee, moved the approval of a brief section of the report dealing with non-panel work. The B.M.A. Council in April last appointed a Committee of members not engaged in National Health Insurance work—viz.: Dr. A. Blackhall-Morison (London), Dr. C. Buttar (London), Dr. H. Cook (Cardiff), Dr. J. Don (Newcastle-on-Tyne), Dr. J. Stevens (Edinburgh), Mr. E. B. Turner (London), and Mr. W. Webster (Newcastle-under-Lyme)—to consider in what manner the Association could best promote the interests of members who had not entered into agreements with insurance committees. The Council was not yet in a position to make any recommendations. Dr. Buttar said that the Committee had not found much work to do, for the panel man was fairly well satisfied, while the non-panel man still made a living. He desired to get rid of the idea that the interests of the Association were becoming wholly bound up with those of practitioners under the Insurance Acts, and he foresaw important questions arising for consideration in view of the possible extension of insurance practice to the families of insured persons and the re-definition of the scope of general practitioner service. He wished to make five points: 1. How was the future of non-panel men affected by the Insurance Acts? 2. The provisions of these Acts, while irksome to the panel man, were insupportable to the non-panel man, and prevented him from working under them. 3. The situation could only be met by a return to the conditions of private practice. 4. Proper application should be made of Section 15 (3) of the original Act. 5. Inquiry should be pressed into the working of the Insurance Acts, where working well, where badly, and what alternative system could be devised more generally acceptable to the profession and of equal value to the community. The report was accepted without comment.

Highlands and Islands.

It was pointed out by a representative of the Highlands and Islands of Scotland that the mileage subsidy from the Treasury had proved of enormous benefit during the past nine years in providing more efficient service for poor persons. The grant had been raised from 6*d.* to 9*d.* and then in 1920 to 1*s.* per mile run, but was still inadequate. Practitioners who derived four-fifths of their income from the Board of Health subsidy could hardly refuse service on instruction from the Insurance Acts Committee, and therefore asked leave to approach the Scottish Board of Health on their own account.

Notification of Venereal Disease.

A motion by Sir JENNER VERRALL, chairman of the Special Committee *re* Notification of Venereal Diseases, for approval of the relevant section of the report, produced a counter-proposition by the Chichester and Worthing branch, "That this meeting objects to any system of compulsory notification of venereal diseases at present." Mr. E. B. TURNER recited the results obtained in various parts of Canada from a graduated system of notification of those who prematurely discontinued treatment. Of 1762 patients warned in Toronto, it had only been necessary legally to proceed against 33. Any proposal for conditional modified notification should be preceded by education of the public by efficient treatment, especially at the hands of the general practitioner in rural areas, and by enforcement of legal action against quacks. Dr. MCGREGOR-ROBERTSON said that 40 to 60 per cent. of Scottish expenditure on venereal disease was wasted because treatment was not completed; they were not asking for notification but for some means of making effective the treatment of uncontrolled persons. It was resolved to leave the subject in the hands of the Council for further consideration.

Votes of Thanks.

On the proposal of the Chairman, the hearty thanks of the Representative Body were given to the following who contributed to the comfort, convenience, and pleasure of the members of the Representative Body and their ladies: The Mayor and Corporation of Portsmouth; Mr. Douglas Handley; the concert party at the ladies' dinner and the smoking concert, and especially Mr. L. Glanville; Mr. Taylor, manager of the Municipal College; Mr. A. W. Ward, borough surveyor; the Southampton Division of the British Medical Association; the Ladies' Committee; Mr. T. A. Munro Forde, chairman of the Dinner Committee; Dr. C. F. Routh, chairman of the Reception Committee; Mr. Bosworth Wright, chairman of the Entertainments Committee; Mr. C. A. S. Ridout, the local general secretary.

On the proposal of Dr. T. W. H. GARSTANG, a previous chairman of the Representative Meeting, a hearty and grateful vote of thanks was tendered to Dr. WALLACE HENRY for his conduct of the meeting.

ANNUAL GENERAL MEETING, TUESDAY, JULY 24TH.

The formal meeting was held at 2 P.M. in the Municipal College, when Mr. C. P. Childe, F.R.C.S., was inducted as President by Sir William Macewen, retiring President. After transacting the statutory business, the meeting adjourned until 8 P.M. in the Town Hall, when Mr. Childe delivered the Presidential address entitled "Environment and Health," which appeared in substantial abstract in our last issue. The President was supported by the Mayor, Alderman F. G. Foster, J.P., Admiral Sir Sidney Fremantle, the Bishop of Winchester, and the executive officers of the Association. In proposing a vote of thanks, Dr. R. Wallace Henry spoke of the address as one in which research and philosophy had been duly blended. There were, he was glad to note, five medical men showing a keen interest in civic affairs by their work on the Portsmouth Town Council. The Bishop of Winchester, who seconded, said that nothing was more important to the welfare of the community than the right mutual relations of the members of the different professions to the places in which they lived. The Mayor, in supporting the vote of thanks, observed that as an ancient borough they had received a legacy of slums which Mr. Childe, as chairman of the Health and Housing Committee, was doing his best to ameliorate.

FUNCTIONS AND FESTIVITIES.

The Annual Dinner.

The annual dinner of the Association took place in the Town Hall on Thursday evening, July 26th. Mr. C. P. Childe, President of the Association, presided, and was supported by the Mayor (Alderman F. G. Foster, J.P.), the Admiral-Superintendent (Rear-Admiral Sir Percy Grant), Colonel Sir Arthur Holbrook, M.P., Captain Walter Elliott, M.P., Sir William Dupree, Sir Harold Pink, J.P., Captain Colin Maclean, and the Rev. W. H. David, vicar of Portsmouth. The toast of "The Imperial Forces" was given by Sir William Macewen, the retiring President of the Association, who expressed his belief that universal manhood training for a year or more during a suitable age would be a good thing for the physique of the nation, while all women should be trained to suitable avocations for the purpose of understanding what war might mean if it came. Sir Percy Grant, Lieut.-Colonel C. W. Mainprise, Wing-Commander R. J. Bone, and Sir William Dupree responded. The toast of "The Mayor and Corporation of Portsmouth" was given by Captain Walter Elliott in a brilliant and amusing speech. There was, he said, no such tyranny in the world as that practised in the sick room by the medical man; and when he was confronted with the spectacle of modern legislature he was apt to treat it with impatience if not contempt. One of the most urgent tasks before the country was the restoration of the local administration which had once been its great pride. The qualities of hospitality, initiative, and self-government in the best sense of the word had, he said, always characterised the town of Portsmouth. Alderman Foster, in replying, expressed his pleasure at having had the opportunity of welcoming the Association on behalf of the corporation. At this point trophies played for on the golf course at Hayling Island earlier in the day were presented—namely, the Ulster Cup to Dr. T. B. Jobson (handicap 9, 4 up on bogey) and the Childe Cup to Dr. J. Kyffin (handicap 18, 3 up on bogey). The toast of "The British Medical Association" was given by Sir Arthur Holbrook, who said the country was appreciating the efforts made by the medical profession to eradicate disease and promote new methods of treatment. Dr. R. A. Bolam, chairman of the B.M.A. Council, and Sir Joseph Verco (Adelaide) responded, the latter voicing the loyalty of the Australian branches. Dr. T. A. Munro Forde proposed "Our Guests," Sir Harold Pink and Prof. A. D. Blackader (Montreal) responding. On the invitation of Sir Jenner Verrall, "The Health of the President" was then drunk with musical honours. During dinner an admirable programme of music was rendered by the band of the Royal Marine Artillery.

Visits to Hospitals.

The chairman of the Royal Portsmouth Hospital Alderman Charles Dye, gave a reception at the hospital on Thursday, July 26th, when he briefly recited the history of the institution on which £34,000 had recently been expended. In 1902 the operations performed on in-patients numbered 531, in 1922 they had increased to 1872; while the population of the town had increased only 25 per cent., the hospital work was more than doubled and the number of operations had trebled. He was a firm adherent of the voluntary principle, free from State or municipal interference.

About 50 members of the Association attended at the Portsmouth and Southern Counties Eye and Ear Hospital on the same afternoon, when cases were shown by Dr. W. S. Inman and Mr. C. A. Scott Ridout, visitors being entertained to tea by the chairman of the hospital, Mr. Henry Dummer.

A party of 200 doctors and friends paid a visit to the Royal Naval Hospital, Haslar, on Friday afternoon, July 27th, when Major Meurice Sinclair, R.A.M.C., gave a demonstration on the treatment of fractures and on a mobile X ray plant. Most of the apparatus in the up-to-date massage department had been presented by the children of the Johannesburg and Rand schools as a war-time gift to the Navy in 1916. Music was supplied by the Commander-in-Chief's band.

Popular Lecture.

A popular address was given on Friday evening, July 27th, by Captain Walter Elliott, Parliamentary Under Secretary of Health for Scotland, on "Assimilation, or Food and Health," Dr. C. F. Routh presiding. Dr. Elliott's main thesis was that tissue-builders must not be neglected by reason of the belief that energy-yielders are the more essential, and he called attention to the liability of manufactured foods brought from long distances to be deficient in some of the elements vital to the body.

Breakfasts.

About 100 guests were present at a Medical Missionary breakfast, the first of its kind, held in the Queen's Hotel, Southsea, on Wednesday, July 25th. Dr. Mary Scharlieb was in the chair, supported by the Bishop of Winchester, Bishop Ingham, and Mr. C. P. Childe. Dr. Duncan Whyte, of Swatow, China, conveyed the greetings of the China Medical Missionary Association and explained its work. Dr. Scharlieb gave a brief address of welcome; she found it hard to understand why Christian members of the medical profession did not take a deeper interest in missionary work. Dr. G. E. Dodson, of the C.M.S., Persia, gave a description of missionary work in Central Persia, where he had been stationed since 1903. Prejudice and intolerance were giving way to a sincere appreciation of the work of the mission. He referred in particular to the unhygienic conditions under which children of from 5–6 years of age used to work in the weaving of Persian rugs, and the late form of rickets which this induced, leading to knock-knee and a high degree of pelvic contraction in girls, necessitating Cæsarean section when they become mothers. Dr. Clement C. Chesterman, of the Baptist Missionary Society, Congo, spoke of the long-continued fight against parasitic diseases which menaced the existence of the population of tropical Africa.

Mr. C. P. Childe presided at a temperance breakfast given by Dame Sophia Wintz, as Vice-President of the National Temperance League in the Grand Jury Room at the Town Hall, on Thursday, July 26th. Colonel C. J. Bond, F.R.C.S., who gave an address, deprecated the tendency shown by the medical profession to be led by rather than to lead public opinion and national habit in the use of alcohol at any given period. Dame Wintz referred to the great work done in the Navy as the result of the efforts of the late Dame Agnes Weston with whom she had been associated for over 40 years.

Social Functions.

Over 1500 guests attended the President's reception at the Queen's Hotel, Southsea, on Tuesday evening, July 24th, which was a very brilliant affair. On the previous afternoon members of the Association attended in academic dress a special service at the old Parish Church of St. Thomas. The Portsmouth division of the Association gave an "At Home" on the Clarence Pier, Southsea, on Thursday evening, July 26th, when more than 1000 guests were received by Dr. and Mrs. Lockhart Stephens, and the Portsmouth Film Service depicted many phases of the Association meetings which had just taken place. The Mayor's Ball at the Portsmouth Town Hall, on Friday evening, July 27th, concluded the series of social functions. About 700 guests were invited and music was provided by Miss Sawyer's band, while Sir John Corke assisted the Mayor in the general direction. The Commander-in-Chief and a large number of civic dignitaries were present. The same evening there were a wind-up Carnival and Dance at the Esplanade Assembly Rooms, and during the afternoon Sir William and Lady Dupree gave a garden party at Craneswater, Southsea.

Excursions and Pleasure Trips.

At the invitation of the Winchester Division a large party motored to Winchester on Saturday, July 28th, and visited the Guildhall, Cathedral, and Winchester College. The Isle of Wight Division arranged an attractive excursion to the island, luncheon being served at Totland Bay and tea at the Royal Naval College, Osborne. Several afternoon parties were shown over the dockyard, visiting H.M.S. *Victory* and H.M.S. *Renown*. Visits were also arranged to Midhurst Sanatorium and to the Hayling Island Branch of the Treloar Cripples' Hospital.

Over 100 members of the Association visited the laboratory of Mr. J. F. Marshall, director of the Hayling Mosquito Control on Hayling Island. The visitors, who included many medical officers of health, were shown maps setting forth the work undertaken in the island and photographs of infected areas before and after draining, as well as tanks containing larvæ of various mosquito species, the life-history of which was demonstrated by Mr. Shute of the Ministry of Health. The salt-water mosquito, *Ochlerotatus detritus*, had been shown to be almost the sole cause of the local trouble, and by draining off stagnant pools of water left inside the sea walls in various parts of the island, the number of these pests was being steadily reduced.

EXHIBITION OF INSTRUMENTS AND DRUGS.

The exhibition of medical and surgical appliances, foods, drugs, and medical literature, was opened in the gymnasium of the Royal Naval Barracks, on Tuesday, July 24th, by Mr. C. P. Childe, as President-elect. Before declaring the exhibition open, the President-elect made a presentation to Commodore C. S. Townsend, R.N., in recognition of the valiant assistance rendered by officers and men of the Royal Naval Barracks in setting out the exhibition. This hall had never been lent before except for Service purposes. The presentation consisted of a fine silver ewer, one of a pair designed by Mr. John Flaxman, R.A., and produced by Mr. Josiah Wedgwood. Commodore Townsend, in reply, reproached the Association for its failing to find a cure for mal-de-mer, that most distressing malady of a sea-faring country. The exhibition was highly representative and well-arranged, part of the large room being set apart for luncheons and teas, a wireless programme being given at intervals. The exhibition remained open until Friday, July 27th, and was well attended throughout. An account of the exhibits will appear in a later issue.

The exhibitors held a Bohemian Concert at the Albert Hall on Friday evening, July 27th, when a number of the Hippodrome artistes took part. The exhibitors expressed their appreciation at the hospitality shown to them by the naval authorities and local medical profession, and a hearty welcome was extended to Mr. C. P. Childe, who was present at the concert.

ASSOCIATED CARDIAC CLINICS IN U.S.A.

THE Association for the Prevention and Relief of Heart Disease (370, Seventh-avenue, New York) has recently issued a pronouncement as to the requirements considered by its members to be essential for an ideal cardiac clinic. These requirements are briefly as follows :—

Medical Organisation.

Ward Service.—Hospital wards should be available for an initial study of each case admitted to the cardiac clinic, for such other investigation as is indicated, and for treatment of patients unable or too ill to receive proper care at home. The cardiac clinic should function as a return clinic for cardiac cases treated in the wards. (The standards referred to below presuppose a ward service in direct connexion with the clinics.) The cardiac clinic should operate as a special section of a general medical clinic to which it should offer aid in diagnosis and treatment. Some members of the staff of the cardiac clinic should have ward duties, and all members ward privileges, with encouragement to follow up cases admitted to wards.

Responsibility for Patients.—When a patient is enrolled in more than one special clinic (cardiac, syphilitic, &c), the responsibility for his proper care must be placed upon one of these clinics, preferably the clinic which provides for the most urgent need.

Staff.—The staff should be assigned definite hours for attendance in the clinic. The chief of clinic should be of rank corresponding at least to that of an assistant-attending physician to the hospital. He should be an internist or pediatrician, with a broad clinical training and a special knowledge of cardiac problems. He should be responsible for maintaining the medical standards, and should supervise diagnosis and treatment by juniors. The medical staff should be relieved, as far as possible, of all duties not directly concerned with diagnosis and treatment of patients. Trained assistants for performing the executive, social service, nursing, clerical and technical functions should be provided. Staff conferences, either of the cardiac clinical staff or of the entire medical staff, should be held at least once each month for the discussion of both ward and dispensary cases.

Social Service.

The *Social Service Section* of the associated out-patient clinics has formulated general standards of organisation and function of social service in clinics. Only certain special points are therefore included in their consideration of cardiac clinics.

Medical Social Worker.—The social service worker should be the clinic executive, and should see that all measures concerned with management of the patients are properly carried out. It has been found that one full-time worker cannot care properly for more than 100 active patients. She should be provided with sufficient professional, clerical, and lay assistants, and should be invited to attend staff conferences. There should be provision for privacy for her interviews with patients.

Space, Equipment, and Records.

There should be adequate room for waiting, examination, and for teaching purposes, where teaching is carried on ; the services of modern X ray plant, an electrocardiographic laboratory, and a proper clinical laboratory should be available. Records of history, physical examination, laboratory investigation, treatment, and follow-up notes, including social service activities, should be kept and filed in a manner meeting the approval of the Association.

Admission and Distribution of Patients.

It is advisable, so far as possible, to limit the use of the clinic to patients residing within a specified district, and to limit its efforts to such numbers as may receive the best care, rather than to dissipate limited facilities upon numbers large enough to make the care inadequate. The patient should be treated by the same physician continuously, interviewed by pre-arranged appointment, and be made to understand that they may visit the clinic before the time of the appointment if they feel it necessary to do so. Only patients having potential or organic heart disease should be enrolled in a cardiac clinic, although any patient may be kept under observation until diagnosis is established. No patient's name should appear on the active list of the clinic if the patient has not attended within six months.

Standards: Examination and Treatment.—Each patient should have a complete physical examination on admission and receive such examination as is necessary on subsequent visits. All doubtful or unusual cases should be seen by the chief of clinic or consulting physician. All cardiac patients should remain permanently under the care of the clinic, even if free from symptoms. There should be at least one physician for every 50 active patients enrolled in the cardiac clinic. Patients should receive instruction list, diet lists, &c., in addition to verbal directions. The amount of medicine dispensed should be sufficient to obviate the return of patients for medicine only. Close coöperation should be maintained with the agencies providing convalescent and country care, and with schools, social agencies, day nurseries, &c. There should be facilities for consultation in all required specialties. It is recommended that a hospital for chronic cardiac disease be available to care for patients in need of prolonged hospitalisation.

Diagnosis of Circulatory Diseases.

Each diagnosis to be complete should include one or more titles from each of the groups, A,[*] B, C, D. Groups E and F, of course, demand nothing but ætiology.

A. *Ætiology.*—(1) Unknown; (2) "rheumatic": acute rheumatic fever, chorea, growing pains, tonsillitis, pharyngitis, others, as purpura, and erythema nodosum, &c.; (3) syphilitic[*]; (4) bacterial[*] (specify bacterium if possible); (5) thyroid[*]; (6) toxic: bacterial, mineral, and vegetable (specify if possible); (7) neurogenic; (8) general systemic disease (specify the disease—e.g., general arterio-sclerosis); (9) traumatic.

B. *Structure.*—(1) Atrophy of heart; (2) enlargement of heart; (3) hypertrophy of heart; (4) cardiac infarction; (5) rupture of heart; (6) cardiac thrombosis: (*a*) auricle, (*b*) ventricle; (7) myocarditis, acute; (8) myocarditis, chronic fibrous; (9) fatty infiltration; (10) fatty degeneration; (11) tumour of heart; (12) endocarditis: acute, chronic; (13) cardiac valvular disease, aortic insufficiency, aortic stenosis, mitral insufficiency, mitral stenosis, pulmonic stenosis, tricuspid stenosis; (14) congenital abnormality (specify lesion if possible); (15) pericarditis: acute, fibrinous with effusion, pneumo-pericardium; (16) adherent pericardium; (17) pericardial effusion; (18) tumour of pericardium; (19) aortitis: without dilatation, with dilatation; (20) aneurysm (specify affected vessel or heart); (21) embolism (specify affected vessel); (22) thrombosis (specify affected vessel); (23) arterio-sclerosis, general; (24) arterio-sclerosis (specify locality as, coronary arteries, cerebral arteries, &c.); (25) arteritis (specify locality); (26) periarteritis (specify locality); (27) no circulatory disease; (28) no cardiac disease; (29) undiagnosed.

C. *Pathological Physiology.*—(1) Regular sinus rhythm; (2) vagal arrhythmia: sinus arrhythmia, sino-auricular block, simple bradycardia, ventricular escape; (3) premature contraction: auricular, nodal, ventricular; (4) simple tachycardia; (5) paroxysmal tachycardia: auricular, nodal, ventricular; (6) auricular flutter: paroxysmal, chronic; (7) auricular fibrillation: paroxysmal, chronic; (8) auriculo-ventricular heart-block: partial block, (*a*) prolonged conduction time, (*b*) dropped beats, complete block; (9) intraventricular block; (10) neuro-circulatory asthenia; (11) valvular incompetency: mitral, tricuspid, pulmonic, or aortic insufficiency; (12) hypertension.

D. *Functional Capacity.*—(1) Patients with organic disease able to carry on ordinary physical activity; (2) patients with organic disease, with (*a*) activity slightly limited, (*b*) activity greatly limited; (3) patients with organic disease unable to carry on any physical activity—i.e., who must remain in bed or in a chair.

E. *Patients with Abnormal Signs and Symptoms.*—Not believed to be due to organic disease: this diagnosis to be "not cardiac—Class E."

F. *Potential Disease.*—Patients without circulatory disease whom it is advisable to follow because of presence or history of an ætiological factor.

Remarks.

The importance of preventive measures in the treatment of heart disease is well recognised; but, in order that such measures may achieve the best results, coördination is essential. Such coördination is the aim of the Association for Cardiac Clinics. Uniformity in diagnosis and treatment in different clinics would, in a short space of time, provide a mass of material capable of yielding valuable information, and so help to hasten the advance of knowledge concerning different cardiac conditions. Both "ideal" and "minimal" requirements are outlined in the present scheme. These, no doubt, may subsequently be found to require modification; for any scheme, however perfect in theory, can generally be improved as the result of experience in practice. Proper stress is laid on the importance of coöperation between the clinics and hospitals, and on the limitation in efficiency imposed by excessive numbers of patients at individual clinics.

In the matter of diagnosis, the scheme presents several important features. The grading of "functional capacity" is eminently practical, the "pathological physiology" can be determined with certainty; but, when one comes to ætiology, the classification is much more difficult. There are, for example, many cases of heart disease which would be labelled by one physician "rheumatic," and by another "of unknown origin." The latter may be an observer no less competent than the former, but he may feel that the evidence is insufficient to justify such a definite conclusion. Unless, therefore, uncontrovertible evidence be available, it would appear that the advancement of knowledge can best be attained if the temptation to attach a definite ætiological title be avoided, and if a considerable percentage of cases be allowed to remain, temporarily at any rate, in the group of "unknown origin."

DONATIONS AND BEQUESTS.—The late Mr. Alfred William Thomas Bean left by will £1000 to the Cottage Hospital, Bexley Heath; £100 each to St. Mary's Hospital, Paddington, Queen Charlotte's Lying-in Hospital, the Consumption Hospital, Brompton, the Hospital for Sick Children, Great Ormond-street, and the Paddington Green Children's Hospital; and £50 each to the Society for the Prevention of Cruelty to Animals and the Society for the Prevention of Cruelty to Children.—By will the late Alderman Francis Day Veasey, of Huntingdon, left £1000 to the Huntingdon County Hospital.—During the past month the Manchester Children's Hospital has received sums totalling £2084, which includes £1000 from the Heath House Orphanage for the endowment of a cot, £225 legacy from the late Mrs. E. Shufflebotham, and £572 from the joint committee of the Manchester and Salford Hospital and Saturday Funds.—The late Sir John William Kelk, London and Thetford, left by will among other bequests £1000 each to St. Mary's Hospital, Paddington, the Middlesex Hospital, and St. John's Hospital for Diseases of the Skin, Leicester-square.—The late Colonel John Goode Johnson, of Stockport, bequeathed £1000 to Stockport Infirmary and £100 each to the Stockport Institute for the Blind, Deaf and Dumb, Ragged and Industrial School, and Sick Poor Nursing Association.—During the past month the St. Mary's Hospitals, Manchester, received £236 in donations. Local and other hospitals benefited to the amount of £500, the proceeds of the Manchester county police sports. As a result of the Rochdale county police sports £1095 will be distributed to Oldham, Rochdale and district charities and police institutions.—By the will of the late Mr. John Black, of Toxteth Park, Liverpool, the charities of this city will benefit to the extent of £15,000; among the bequests are £1500 to Liverpool Royal Infirmary, and £1000 each to the Royal Southern Hospital, David Lewis Northern Hospital, Children's Infirmary, Myrtle-street, Hospital for Consumption and Diseases of Chest, Stanley Hospital, and Seamen's Orphanage.

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[*] In the case of each of these conditions, it should be noted whether the ætiological factor is still *active* or is *inactive*—e.g., (A) Active syphilitic. (B) Aortitis with dilatation, aneurysm of ascending aorta. (C) Regular sinus rhythm. (D) Class II.a; or (A) Inactive rheumatic (acute rheumatic fever). (B) Valvular disease, mitral insufficiency, mitral stenosis. (C) Auricular fibrillation. (D) Class II.b.

THE LANCET.

LONDON: SATURDAY, AUGUST 4, 1923.

LOCAL HEALTH ADMINISTRATION.

SPEAKING at the annual banquet of the British Medical Association last week, Captain WALTER ELLIOT said that one of the great tasks of Britain now was to restore local administration, once the pride of this island. The peculiar qualities of the English, the Scottish Secretary added, might be best seen in the genius they displayed in getting other people to work for them. The issue of the report by consultative councils of the Scottish Board of Health on a reformed local authority for health and public assistance[1] is a reminder that although an English Ministry and a Scottish Board of Health have been formed, unifying to a certain extent central administration, local public health administration remains in an unsettled condition. The necessity for reform was made manifest by the reports of the Royal Commission on the Poor Laws. Both minority and majority reports of this Commission recommended abolition of the boards of guardians, and had there not been disagreement on important points of detail the subsequent history of public health insurance in this country might have differed greatly from the actual course of events. By means of the Maclean Committee a *modus vivendi* between these reports was agreed upon, but although promises were made of action in the direction of the report of this Committee, little yet has been done of which the public know. The report of this Scottish Committee may, it is hoped, bring the problem once more within the range of practical politics, and Scotland, as has happened not infrequently in the past, may show England the way to more efficient and therefore more economical public health administration. But it must be remembered that the difficulties in England are immeasurably larger, because of the numbers concerned, and the complexities left by previous good and pioneer work.

The two main needs for reform, as stated in the report, are exemplified as fully in English as in Scottish local authorities. There is overlapping and waste, due to the distribution of the local administration of the health services among several different authorities in each area, and many of the administrative units are too small to carry out efficiently the powers and duties laid on them by Parliament. The drastic character of the recommendations of this Consultative Council may be gathered from the fact hat their proposals would eliminate for the major purposes of health administration 98 district committees and 194 out of 201 boroughs having a populaion of less than 50,000, while 869 parish councils and 7 district boards of control would cease altogether. t is very properly pointed out that so far from hese proposals interfering with local administrative autonomy, more representative and more powerful local authorities would be created, justifying greater freedom in the exercise of their functions. Evidently these proposals cannot be carried out without opposition. Every small local authority has a vested interest in continued existence, though Parliament should be strong enough to resist the pressure of opinion inimical to reform. The transfer of the work of local insurance committees to committees of the new authority implies a change in the original plan of the National Insurance (Health) Act, removing the redundant insurance committees while arranging for the coöption on the insurance committee of the local authority of members of bodies specially interested in this work. The proposed transfer of the functions of parish councils to the county councils and town councils will simplify considerably the work of public assistance and eliminate much of the overlapping of public health and Poor-law work which now exists.

The medical profession are much concerned in the reforms proposed in this report. It is greatly to their advantage and much more so of their patients that relationships with official bodies should be simplified, that official medical work should be more accurately defined, whether parochial or insurance work or public health work proper, and that medical men and their organisations should be able to approach a single authority competent to deal with all the branches of work in which the medical profession are specially concerned. Here and there, no doubt, a forceful and tactful personality makes up for the shortcomings of a bad system: in one place, as at Portsmouth, a local hospital surgeon is chairman of the health committee; in another, a general practitioner presides over the insurance committee; in a third, the medical officer of health is the pivot of all the health activities of the sanitary area. But mind cannot so triumph everywhere over recalcitrant matter, and a remodelling of the framework of public health is a first necessity for a community that desires medical knowledge and experience to be translated into the elements of healthier living. We know that the Ministry of Health is making headway, but we have a feeling that the problems entailed by the centralisation of such great and varied activities are not appreciated by our readers—and certainly not by the public.

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PRECIPITATION TESTS FOR SYPHILIS.

FAIRLY soon after the introduction of the Wassermann test, in the endeavour to elucidate its mechanism and as part of the controversy which arose as to its nature, it became apparent that out of a mass of work the general fact was emerging that under many conditions syphilitic sera would give precipitates more readily than would normal sera. The possibilities of this fact are considerable. Though one of the most trustworthy of all clinical-pathological diagnostic measures, the Wassermann test contains a large number of variable factors, which must be carefully adjusted to render results of constant accuracy. The test consists of two parts. In the first the syphilitic serum and antigen are brought together in the presence of complement, and in the second the existence, or disappearance, of this complement is sought for by adding blood corpuscles and the appropriate specific hæmolytic serum. We hold the view that the essential of the test is the production of a precipitate between the syphilitic serum and the antigen, which is a colloidal suspension of lipoid particles. In the presence of syphilitic serum the physical state of this colloid differs in an only partially known fashion from its state in the presence of normal serum, and in the former case it is particularly favourable to the adsorption and inactivation of complement, which thus disappears from the mixture so far as its subsequent demonstration is concerned. It is therefore obvious that if we could detect this alteration in the antigen visually we should be able to dispense with complement, hæmolysin, and blood cells, all variable factors, and not only simplify the test but probably render it more accurate. This is the end striven for by precipitation tests, which were first popularised in practicable form by Sachs and Georgi and have since been modified in various directions by others. The essential question which remain to be answered, assuming the above theoretical explanations to be correct, is: Is the visual method as delicate a one for detecting the formation of a precipitate between serum and antigen as is the fixation of complement? This is the main point of interest in comparisons of the two tests, such as those we recently published. It is an important point since upon its answer will depend the form of the serum test for syphilis which should be adopted in the immediate future. In this connexion we would point out that it is already abundantly proven that a strongly positive Wassermann reaction corresponds, for all practical purposes, to a strongly positive precipitation test, but that in both cases the shading-off from the positive into the negative is not an abrupt process. Research therefore should be directed not only to the finding of conditions which will magnify the positive reaction and minimise such change as occurs in negative cases, but towards the weakly positive, the evolving, and declining cases. Comparison of the two tests with the clinical condition, which must always be closely watched, will yield information of the most value as to their relative merit.

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[1] Reports by Consultative Councils on a Reformed Local Authority for Health and Public Assistance, price 1*s.* 3*d.*

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PUBLICATIONS WHICH "TEND TO DEPRAVE."

A few days ago in the Court of Appeal Mrs. Marie Stopes succeeded in obtaining the fruits of her libel action against Dr. H. Sutherland and his publishers. There is no occasion now to reopen the controversy over what is popularly known as birth control; the views of both sides were sufficiently expounded at the original trial by witnesses of considerable weight and known sincerity. Nor is there any need to comment on this unfortunate litigation wherein, when the jury had duly answered the questions submitted to it, what should have been the end of the case proved to be merely the starting-point for fresh legal argument. The controversy, however, bore indirectly upon a point of some interest—namely, the immunity of technical publications from the criminal law as to the publication of matters obscene or indecent. Dr. Sutherland had *inter alia* written of certain of Mrs. Stopes's publications the remark that "Charles Bradlaugh was condemned to jail for a less serious crime." The comparison is a reminder of the change in public standards over the period of half a century. To publish any obscene or immoral book is a criminal offence—a common-law misdemeanour. The judicial test of obscenity is "whether the tendency of the matter is to deprave and corrupt those whose minds are open to such immoral influences and into whose hands a publication of this sort may fall."

Legal authorities of repute still lay down the principle, enunciated more than 50 years ago by Chief Justice Cockburn, that a medical treatise with illustrations necessary for the information of those for whose education or information the work is intended may, in a certain sense, be obscene, and yet will not give rise to criminal proceedings, though, if such illustrations are "exhibited for anyone, boys and girls, to see as they pass," it may constitute an offence. The immunity, in fact, depends upon the circumstances of the publication. Certain observations during the recent libel action are a judicial recognition of a relaxation of the public standard of what tends to deprave. In 1877 Charles Bradlaugh was convicted, along with Mrs. Besant, of the criminal offence of publishing Knowlton's tract "The Fruits of Philosophy," an essay on the restriction of the population. The jury declared that the book was calculated to deprave public morals, and the Lord Chief Justice of the day condemned both defendants to be imprisoned for six months, to pay a fine of £200, and to enter into recognisances for five years to be of good behaviour—good behaviour including the withdrawal of the book. Now let us listen to something said by Lord Justice Scrutton the other day:—

> "In 1877 it would have been almost impossible to discuss publicly a subject of admitted importance, the causes, effects of, and remedies for venereal diseases, but since the war the most respectable newspapers have opened their columns to the plainest discussion of these matters and the most respectable persons have taken part in those discussions. The merits and methods of artificial birth prevention seem to me to stand in a similar position. In 1877 it would have been impossible to discuss them publicly; in 1923 there is probably a great change in public opinion as to the necessity of discussion coupled with great difference of opinion as to the desirability of such methods."

If Charles Bradlaugh had published Knowlton's book to-day, would he have been prosecuted, much less convicted and sentenced to imprisonment? Doubtless the answer would depend on the circumstances of the publication. Propagandists do not always discriminate, and the old tag *maxima debetur pueris reverentia* is not yet obsolete. If we protect our schoolboys from the attentions of betting touts and money-lenders, we need not expose them to those of the booksellers who specialise in furtive pornology. Writings on birth control which are very far from belonging to that discreditable traffic have in recent years been treated by police-court magistrates as having a tendency to deprave. Such decisions are not easily harmonised with the greater latitude to which Lord Justice Scrutton gives testimony. As every magistrate is entitled to take his own standard in these matters, the position is none too clear. The policy of Parliament seems to be towards greater control. It will be remembered that in 1917, in suppressing quack treatment of venereal disease, the circulation of advertisements dealing with such treatment was prohibited. The proposed Judicial Proceedings (Regulations of Reports) Bill, designed to eliminate indecent details from the reports of divorce and other proceedings, is a significant movement in the direction of suppressing matters "tending to deprave."

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PHYSICAL TRAINING IN THE NAVY.

The Navy has, as we know, done a great deal to help the British Medical Association meeting of this year, and in the afternoon of July 25th the members of the Association were invited to the Royal Naval School of Physical and Recreational Training to witness a demonstration of the education there given. In a fine gymnasium, on a floor whose boards recalled the whiteness of the old Navy's decks, were seated motionless a large squad of sturdy young seamen, who were later to demonstrate the work of the school in which they are undergoing the six months' course for instructors. The Commander-in-Chief having arrived, Sir PERCY BASSETT-SMITH voiced the pleasure and gratitude of the Association at being invited to the demonstration. Surgeon-Commander K. DIGBY BELL explained the purposes of (*a*) physical training, to develop the recruit, teach him discipline, and make him anxious for more training; (*b*) physical exercise, to make him thereafter ever more and more fit; and (*c*) recreational training, to encourage the team spirit and develop alertness and other desirable qualities. Then were shown, first free standing exercises to show the gradually increasing severity of the practices, and the systematic attention paid to the equal use of all the muscular systems; these together teach a man to think and to strengthen his body, and are followed by activity exercises which make him supple. This is a school for instructors, and their teaching, and the teaching of judges and referees, were explained and then illustrated by a sabre *v.* sabre combat, and an exhibition boxing match, in which the combatants successively and by order did all the horridest things, as kidney and rabbit punches, and got freely knocked down, according to plan. Surgeon-Commander DIGBY BELL being here replaced as lecturer by a lieutenant-commander, clever and daring exhibition work was shown on the horizontal and parallel bars, and on the horse, this last without any spring board. Two instructors showed how men were taught in self-defence training to fall safely, by falling protectively, not on their bones, but on the muscles between the joints, and they illustrated how skilfully an opponent, even when attacking with a knife, could be countered and overset by an expert. Then the recreational games were shown, many of them. A ship is small, and has many men; they must take little room. They are extremely exciting, very popular, and no one is a good instructor who cannot invent a new game or make his squad interested in an old friend. Thus, two squads, "red" and "green," each of ten men, competed against one another; while the "reds" tossed a ball from one to the other round an inner circle, "green" with eager feet were running a relay race round them, and the instructor announced that simultaneously "red" had made 105 catches. Then "red" raced like mad round the catching "green" who, alas! owing to a dropped catch, and time so wasted, only scored 88 catches in their period. One expected that he who missed heard a good deal afterwards about his mistake, and would be very effectively stimulated to do better next time, and that is the object of these games, to strengthen the team spirit and secure accuracy of effort. After the gymnasium the swimming-bath, whose milky-blue water evidenced its careful disinfection: here swimming training and pretty diving off trapezes brought the demonstration to a close. The thanks of the visitors to the Navy was expressed gracefully to the Commander-in-Chief by Dr. LOCKHART STEPHENS, the Vice-President of the Southern Division, and the officers of the Naval Barracks (H.M.S. *Victory*) then kindly entertained the party at tea after a most nteresting two hours which showed what great use was now being made by the Navy of its capable medical officers in the training of the Service, educating the personnel to keep themselves always in the best of physical condition, and ready to deal whatever may be before them of unforeseen, unimagined conflicts and emergencies.

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THE LANCET CENTENARY DINNER.

THE dinner in celebration of the completion of the hundredth year of THE LANCET will be held at the Hotel Victoria, Northumberland-avenue, London, W.C., on Thursday, Nov. 29th, 1923, and not as previously announced on Nov. 28th. Mr. Neville Chamberlain, the Minister of Health, has signified his intention to be present.

Annotations.

"Ne quid nimis."

NATURAL AND ARTIFICIAL SUN CURE IN TUBERCULOSIS OF THE LUNGS.

THE brilliant results obtained by intensive sun treatment in so-called surgical tuberculosis not only at high altitudes, but also in low-lying districts, have for many years been recorded; but the results on tuberculosis of the lungs have been, in many hands, disappointing, and have led to avoidance of the treatment by many physicians, and even to its condemnation by some as a dangerous and unjustifiable form of therapy. Dr. Johannes Schürer,[1] of Mülheim, combats this idea as a false one, maintaining that the action of the sun is not only on the diseased organ or part, but mainly on the whole body. The old tradition that direct sunlight is dangerous in cases of phthisis still holds sway in the minds of the majority of the medical profession, in spite of the fact that Finsen reported good results 20 years ago, and that in 1903 Nizza used the sun cure methodically, and demonstrated that the sunlight stimulated the nervous system, producing dilatation of the blood-vessels, lowering the blood pressure, and favouring the healing of the foci in the lungs. In the sanatorium treatment developed during the last 50 years, the action of direct sunlight plays no part, and no provision is made for it in the vast majority of sanatoriums. In 1921 Hoffner[2] wrote: ". . . . it was attempted to make the sun the cure for phthisis. The experience of all observers was, however, that the effect was harmful. . . . Existing latent processes became active," and he expressed the opinion that in every condition of tuberculosis of the lungs sunbaths were to be avoided. Bacmeister[3] came to the same conclusion, stating that "the most dangerous is the simple lying in the sun in the first tempting days of spring, or after a long period of dull weather. Each year a number of patients come to me who in this way have developed new foci, pleurisy, hæmoptysis, and other complications." Koch[4] reports similar cases of sunbaths undertaken by the patient without medical supervision resulting in a rise of temperature, increased cough, and hæmoptysis.

Nevertheless it would be a great mistake to confuse such unsupervised, unsystematic, and over-dosed sunbaths with a true sun treatment. Dr. Schürer points out that spontaneous self-treatment gives the effect rather of a "sunburn," and that good effects can only be obtained by means of exact medical observation and supervision. His own experience has been mostly on phthisical patients with well-marked lesions, too severe to be sent to the outlying country sanatoriums. The sunbaths were taken on the roof of the Evangelisches Krankenhaus in Mülheim, sheltered on two sides from wind currents. The roof of any town hospital might well be put to such use, and has the additional advantage of getting the sun at all times of the day, and of not being overlooked by other buildings, two objections to most verandas. The only cases which were not given heliotherapy were those with marked cachexia and high fever, those who were too weak to wash themselves, and those with large cavernous or pneumonic processes. On the other hand, hæmoptysis was not considered a contra-indication. In every case the patient was slowly acclimatised to the sunshine, starting with five minutes, with the legs only exposed, and slowly increasing daily with exposure of the arms and chest until in 12 days a complete sunbath of an hour's duration was allowed. In 24 days two hours were reached, and in some cases three hours, the time of the day chosen, and the length of the treatment ultimately depending on the weather and on the time of the year. It is obviously impossible to lay down any fixed regime in a variable climate. As an indication of the dose, the subjective sensations of the patient were largely taken into account and were found to be more important than the exact number of minutes that the treatment lasted. In this respect it is essential to obtain the coöperation of an experienced nursing staff. In 63 cases treated by Dr. Schürer no ill-effects were noted, in no cases did the temperature rise more than 0·2–0·3° C., there was no increase in the quantity of sputum, and no case showed signs of new foci or activity in an old one as a result of the treatment. Out of his cases 11 had previously had hæmoptysis, one 14 days before the commencement of the cure. In no single case did hæmoptysis occur during or after the treatment. The blood pressure was found to be usually slightly lowered during a sunbath, but was not constantly so. No increase was, however, observed, and this is additional evidence that heliotherapy bears no direct relation to hæmoptysis. The results of the treatment, when compared with those of the ordinary hospital treatment, were remarkably good, improvement taking place in severe cases which would have been given up under ordinary circumstances. In unfavourable weather artificial sunlight was given, so that patients who had become acclimatised to the sunlight should not lose their immunity and have to begin all over again.

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[1] Deutsch. med. Wochens., June 1st, 1923.
[2] Strahler-Ther., 1921, xii., 819.
[3] Zschr. f. ärztl. Fortbild., 1921, xviii., 284.
[4] Strahler-Ther., 1922, xiii., 134.

Dr. H. Gödde,[5] of Honnef am Rhein, reports on the action of the quartz lamp in tuberculosis of the lungs. He radiates the chest and back three times a week, gradually increasing the duration. He has treated 655 cases during the last eight years, and points out that the treatment is not without danger, although if properly regulated it becomes a valuable adjunct to other forms of treatment. In 57 of his cases he observed an unmistakable reaction, with an increase in the physical signs in the chest. Cases of all degrees of severity were treated, but of those showing an unfavourable reaction, only 14 had tubercle bacilli in the sputum. In most of the cases it was wellnigh impossible to say if the bad effects were due to the quartz lamp, or would have come spontaneously or were due to some other factor; but in some of the cases there was a definite relation between the treatment and unfavourable symptoms, which could be produced at will in the form of an experiment. An illustrative case was that of a man aged 19, suffering from dry pleurisy, nodular fibrosis in the lungs, and tuberculous epididymitis. The temperature was normal, but on the evening of the third radiation rose to 38·5° C., and on the following evening to 39·5° C. He had a severe cough and a marked pleural rub. The temperature fell in 15 days. After 16 days free from temperature, the radiation was repeated. After two minutes the temperature rose to 37·3°, after four minutes to 37·5°, and after eight minutes to 40°. Well-marked signs of foci in both apices appeared, which, in spite of many weeks in bed, never quite disappeared during the whole course. The temperature returned to normal in 27 days. Hæmoptysis was noted in many cases after radiation, and Dr. Gödde is of the opinion that the treatment should not be used in advanced cases. Exact observations should be kept of the temperature and of the general condition, and although it is safe to treat patients ambulatorily so long as there is no reaction, on the first sign of any reaction they should be confined to bed. When they are under careful supervision he does not consider that a reaction is detrimental, but rather that it leads eventually to an improvement in both the local and general condition.

THE NOTIFICATION OF TUBERCULOSIS.

A LETTER has been sent personally during the week by the Ministry of Health to private practitioners throughout England and Wales reminding them of their statutory duty to notify cases of tuberculosis as soon as the diagnosis is made. This duty was enjoined by the Public Health (Tuberculosis) Regulations of 1912, but it is common knowledge that in some areas a large proportion, sometimes nearly one-half, of the persons dying from tuberculosis had not been previously notified as suffering from that disease. The practitioner is, of course, absolved from the duty if he has reasonable grounds for believing that the case has already been notified to the sanitary authority, but the Minister of Health puts upon him the onus of ascertaining this fact in case of doubt. Early notification of tuberculosis is rendered difficult by the fact that, in spite of all our progressive knowledge, early diagnosis is in many cases still difficult, and unfortunately there are persons who do not consult a doctor until the disease is in an advanced stage. Under the Regulations the notification is strictly confidential, and the fact of a patient suffering from tuberculosis becoming known to employers or neighbours through the medical officer of health can be disregarded. Notification is ordinarily followed by a visit from the tuberculosis officer; where in a particular case the practitioner considers this unnecessary it is now open to him to arrange that this visit shall be dispensed with. No doubt the circular letter will help in clearing up points which have so far stood in the way of whole-hearted observance of the Regulations.

APPENDICITIS CAUSED BY THE ASCARIS LUMBRICOIDES.

IN view of the rarity of parasitic infection of the appendix cavity in this country a case of ascaris appendicitis recorded in the June number of the *Irish Journal of Medical Science* by Dr. Kathleen Portley, is noteworthy. In February last a boy aged 4 was sent to St. Vincent's Hospital as a case of acute appendicitis. Ten days previously the patient had an acute attack of abdominal pain accompanied by vomiting and a rise in temperature which fell to normal in three days, the pain remaining. On admission the abdomen was very rigid, and there was general abdominal tenderness, most marked over McBurney's point. At operation, by Mr. H. S. Meade, the mesentery was found to be studded with tubercles with a slight amount of pus in the right iliac fossa, and wandering free in the peritoneal cavity was a worm about 6 inches long of the *Ascaris lumbricoides* type. There was no sign of perforation of the intestine, but the ascaris was found to have emerged from the alimentary canal by perforating the tip of the appendix, which was slightly inflamed. Appendicectomy was followed by a speedy recovery, anthelminthics being administered during convalescence. Dr. Portley, in examining the literature, has found no record of a similar case, though the presence of ascaris in gall-bladder and ducts has often given rise to serious complications.

A NEW HEALTH INSURANCE CODE.

EARLIER in the year, when urging that the Public Health Acts should be reduced into one complete and up-to-date document, we mentioned the probability that this process would first be applied to the law of National Health Insurance.[1] The anticipation has been justified. A bulky House of Lords Bill has just appeared. It can make no immediate progress, but, when Parliament reassembles, once the Bill has passed the scrutiny of the Joint Committee on Consolidation Bills, it should speedily become law. The Bill consists at present of 133 clauses and six schedules. On a casual examination it seems to be well planned and sensibly arranged, so that laymen as well as lawyers will be able to find their way about it. All the old law is to be repealed, with the usual saving clause that outstanding rules and regulations (and it is often the regulations rather than the Act itself which most concern the medical practitioner) made under any repealed Act shall continue in force as if made under the corresponding provisions of the new law. As the new Bill appears to be pure consolidation and not to include any proposals for amendment, its passage through Parliament should be the easier. In introducing it into the House of Lords on July 26th the Earl of Onslow stated that, as soon as the Bill was passed, the consolidation of all statutory regulations on the subject would be undertaken. He also announced that a consolidation of the Housing Acts was intended. Meanwhile it is to be hoped that the Public Health Acts are not being forgotten. Their confusion is greater than that of the Health Insurance Acts, and they had a prior claim to be considered for consolidation.

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[5] Deutsch. med. Wochens., June 15th, 1923.

[1] THE LANCET, 1923, i., 857.

THE TREATMENT OF VARICOSE VEINS: A NEW OPERATION.

VARICOSE veins, as is well known, occur in all classes, affecting both men and women, and in those following both sedentary and active occupations. Mr. Philip Turner[1] points out that while it is generally agreed that the essential factor is an increase of pressure in the veins, it must be admitted that in the greater number of cases presenting themselves for treatment no definite cause for the increase in pressure in the veins and no obvious cause for impeding the circulation can be shown. He offers an ingenious suggestion as to the cause of the obstruction to the return of blood in cases where it is not obvious, and describes a method of operative treatment which he has found successful. He believes that in a considerable proportion of cases of varicose veins, especially in those where the patient follows an occupation requiring prolonged standing, the real cause of the trouble is an obstruction to the flow of blood where the internal saphenous vein near its termination passes through the saphenous opening, leaving the subcutaneous tissues to join the more deeply placed and better supported femoral vein. He recalls the anatomy of the saphenous opening bounded on the outer side by the iliac portion of the fascia lata which has a sharp well-defined edge known as the falciform border. The upper wall of this (the superior cornu) turns inwards superficial to the femoral sheath to join Poupart's ligament. The lower portion, known as the inferior cornu, curves inwards, deep to the termination of the internal saphenous vein but superficial to the femoral sheath, to become continuous with the pubic portion of the fascia lata which covers the pectineus and adductor longus muscles, and is attached to the ilio-pectineal line of the pubis. Though there is no sharp alteration in direction, the internal saphenous vein here crosses the well-defined inferior cornu of the falciform edge and joins the femoral vein on a deeper plane, the sharp fascial margin intervening between the two vessels. This is a relationship where, according to Mr. Turner, some factor may easily produce a slight but definite degree of obstruction, which, acting continuously or intermittently over long periods, may produce far-reaching results. This additional factor is, he suggests, increase in the tension of the fascia lata. In the sitting or recumbent position the fascia lata is relaxed; in the erect position, on the other hand, the fascia lata is tense, and so also must be the sharp falciform edge with its superior and nferior cornua, the latter between the superficial and deep venous trunks. The obstruction need not be complete: a slight degree of interference acting over a long time will be quite sufficient to overfill the veins, to cause them to dilate, and eventually to become varicose. After a time the weakest valves will become ncompetent, and then the effect of the increased pressure will be felt still more in the veins lower down in the leg. The localised swelling occasionally een and known as a saphenous varix Mr. Turner attributes to a localisation of the trouble by a particularly competent set of valves which protects he distal portion. More generally the valves become incompetent, and the back-pressure, increased by the weight of the column of blood, affects first of all the vein and its tributaries below the knee. Another possible cause of obstruction at the termination of the saphenous vein are its tributaries—the superficial epigastric, the superficial circumflex iliac, and the external pudic vein—which are often surprisingly large, and the flow from them being from above downwards is in direct opposition to the flow of blood in the internal saphenous. This opposition to the return of blood in the internal saphenous, though probably trivial in the sitting or recumbent positions, may be of considerable importance in the erect position with a tense fascia lata and margin of the saphenous opening.

Mr. Turner suggests that in the operative treatment of varicose veins it is a wrong principle to excise or obliterate the main trunks of venous return, especially the chief of these, the internal saphenous. If the main trunk is removed a great strain must of necessity be thrown upon the smaller and less important vessels, with the result that they dilate and become varicose. The plan adopted by him is the excision of any large varicose veins. In those cases where it is considered that the varicosity is caused by obstruction at the saphenous opening he also divides the fascia lata from the saphenous opening downwards and transplants the long saphenous vein beneath the fascia, which is then sutured over it: at the same time the tributaries which join the internal saphenous at its termination are divided and ligatured. He does not suggest that this operation should be performed indiscriminately; on the contrary, a careful selection of cases must be made. But in a young or healthy middle-aged person, where other causes are absent, where the saphenous vein is thickened and dilated but not tortuous and varicose, where the varicosity affects the lower part of the internal saphenous and its tributaries, but where the small venous radicles are not involved, success may be expected. Mr. Turner has performed this operation, of which he gives full technical details, some 20 times during the past four years, and the results have been so encouraging that he intends to continue this method of treatment.

THE SOCIAL WELFARE OF THE INSANE.

IN a pamphlet printed in aid of the Society of the Crown of Our Lord[1] Dr. J. R. Lord has dealt with the problem of the social welfare of the patient in a mental hospital, believing that the time has come to revise the attitude of seclusion resulting from the cloudiness of mediæval thought which still darkens the public outlook in this connexion. Recalling the state of affairs before 1766, when "the doors of Bethlem were finally slammed in the faces of curiosity and wantonness," Dr. Lord states that "one has only to call to mind the disgraceful scenes which often characterise the admission of the public to the hearing of sensational divorce or murder cases to be reminded that there is a section of the public whose appetite for the morbid and unsavoury is insatiable, and there is not a doubt that the mental hospitals have had good grounds for their attitude to publicity." This attitude, however, has helped to maintain the continuity of public ignorance as to what insanity really is, although to say that the insane are treated "behind a shut door" is misleading. Dr. Lord points out that there must be at least 20,000 people employed in mental hospitals, that about 10,000 patients pass through the hospitals each year, and that anyone who gives the name of a patient can gain admission on visiting days; thus it would be difficult to keep anything secret save those personal details which are guarded as a matter of course. Nevertheless, the atmosphere of isolation persists, with detriment to the progress of psychological medicine, and Dr. Lord would have the life of the outside community brought to bear upon the life of the mental hospitals by means of hospital visitors and social workers.

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[1] Guy's Hospital Reports. London: Henry Frowde and Hodder and Stoughton. Vol. III. Fourth Series. No. 2.

[1] Social Workers and the Insane. An address delivered before the Society of the Crown of Our Lord in London on May 3rd, 1923. London: Adlard and Son and West Newman, Ltd. 6*d*.

> "Truly a mental hospital is a house of comedy and tragedy. Reasoning and argument have no practical value therein. Only sympathy, kindness, and true friendliness are of any avail. . . . How are the insane kept in a mental hospital? If they decided to go home, home they would go. Our light hospital buildings and the proportionately few nurses would not keep them a moment; yet escapes from asylums are perhaps fewer than from prisons. . . . Bars to windows, physical restraint, &c., are practically unknown nowadays in mental hospitals. The chains are there, however, although not forged from iron or steel. They are much stronger and more effective, being links of kindness and persuasion, the artificer being the doctor and the nurse. So it is not that the ground is barren for the exercise of these virtues."

Every mental hospital ward or group of wards, then, should have its social visitors—level-headed, discreet, and kindly men and women with some idea of mental disorders, who would pay particular attention to friendless patients, and would act as a connecting link between those patients who had homes and their relatives. The onset of mental disorder which leads to a patient's removal from home is often sudden, and the effects upon family affairs catastrophic; here there is obviously a useful avenue of work for the social visitor. Moreover, the visitor would gather valuable information concerning the patient's home environment, which would help the medical officer in his treatment and disposal of the patient. Dr. Lord speaks of the great difficulty of arriving at the truth in cases of mental disorder, the relatives being frequently unwilling to disclose information; here the social visitor's evidence would materially assist the case. Dr. Lord quotes the successful experiment begun at Horton Mental Hospital, Epsom, in June, 1922, when Miss E. M. Dale was appointed as hospital visitor. Although this lady has limited her activities largely to recently admitted patients and to acute cases, she has also followed up cases sent to the main building, and lately has also been investigating the condition of patients prior to admission. The results have been so successful that the hospital management are keenly desirous of extending such work to the whole building, and for this purpose more helpers are required. This is a beginning. The strength of the movement will be founded on the fact that such visitors will not be officials, and will, therefore, be free from the suspicion with which all official asylum workers are regarded. Dr. Lord closes his remarks with a reference to the already extensive social work of this nature carried on in connexion with State mental hospitals in America, and with the expression of a certainty that before long no mental hospital administration will be considered complete without its hospital visitors and associated workers.

ACETYLENE AND ETHYLENE AS ANÆSTHETICS.

RECENT contributions, both on the continent and in Canada and America, have amplified our knowledge of the anæsthetic action of ethylene and of acetylene. The number of cases so far reported is not great but suffices to show that both these gases are capable of producing complete muscular relaxation in some subjects and can be safely extended over periods of time long enough for most major operations. Both gases are, of course, highly inflammable, and ethylene provides with air an explosive mixture if it reaches the proportion of 4 per cent. Acetylene and ethylene are used from cylinders like those employed for nitrous oxide, and are given together with oxygen. Acetylene is administered in the proportion of 60 per cent. to start with. This is generally increased to 70 for producing full anæsthesia and can afterwards be lowered even to 20 or 30 per cent. in the course of a long operation. The inhalation is said to produce no disturbance of pulse, respiration, or blood pressure. Recovery is described as being remarkably rapid and the proportion of subjects suffering from post-anæsthetic nausea or vomiting small. In the case of ethylene there were 14 instances of vomiting after 92 inhalations. Gauss and Wieland have used acetylene in 220 cases. They precede the inhalation by one or more injections of morphia and scopolamine. The anæsthesia produced by both ethylene and acetylene appears to be comparable with that obtained from nitrous oxide. Wieland believes that this is essentially different physiologically from the anæsthesia of ether and chloroform and the other lipoid-solvent anæsthetics. His argument, however, comprises the disproved supposition that nitrous oxide and oxygen cannot produce anæsthesia unless administered under pressure. This was, of course, Paul Bert's belief, but it has been fully shown to be erroneous.

DANGEROUS DRUGS.

IN pursuance of Section 7 of the Dangerous Drugs Act, 1920 (10 & 11 Geo. 5, cap. 46) a regulation—the Dangerous Drugs (No. 3) Regulation—amending the Dangerous Drugs Regulations, 1921, has been made. Regulation 15 of the Dangerous Drugs Regulations, 1921,[1] will take effect after August 1st, as if at the end of the regulation were inserted the following words:—

> "If a foreign ship in any port in Great Britain requires to obtain a supply of any of the drugs in order to complete the necessary equipment of the ship, the master of the ship is authorised to purchase and be in possession of such quantity of any of the drugs as may be certified by the medical officer of health of the port where the ship is (or in his absence by the assistant medical officer of health of the port) to be necessary for the purpose, the quantity not to exceed what is required for the use of the ship until it next reaches its home port. The certificate given by the medical officer or assistant medical officer of health of the port shall be marked by the supplier with the date of the supply and shall be retained by him and kept available for inspection."

THE TREATMENT OF NERVOUS POLLAKIURIA.

A COMPARATIVELY rare manifestation of a psychopathic constitution is frequency of micturition for which no organic cause can be found. A report by Dr. Chavigny in *Paris Médical* for June 30th deals with two such cases, which show how easy it is to go astray in the treatment of this condition, and how, by appropriate treatment, a complete cure can be effected. The first patient was a man, aged 21, whose father had suffered from incontinence of urine, and whose mother and sister were extremely neurotic. The patient had never been seriously ill, and there was no record of nocturnal enuresis beyond the normal limits of infancy. For several years frequency of micturition had become progressively worse, and he had to get up at night five or six times to pass water. There was also pollakiuria by day, and when he could not at once respond to the desire to micturate he experienced severe pain in the lower abdomen, and there was spasmodic retention of urine for some little time. Examination in hospital failed to show any local pathological condition to account for his symptoms, and the history he gave of the treatment he had hitherto received was as instructive as it was full of mistakes. His first medical adviser, consulted in 1921, had diagnosed gravel, and had prescribed the treatment supposed to match this disease. The results were entirely negative. The next practitioner made a rectal examination and diagnosed prostatitis. This, of course, required massage of the prostate, but again no benefit was obtained. The third practitioner consulted decided that the urinary tract was intact, and that the condition requiring treatment was a muco-membranous enteritis. A fourth practitioner found a little cystitis, but was not inclined to prescribe intensive local treatment, regarding the pollakiuria as a concomitant of disordered intestinal functions. Dr. Chavigny, being unable to find any organic disease such as tuberculous cystitis, decided, more or less by a process of exclusion, that the irritability of the bladder was of psychic origin. His first therapeutic essay was a complete failure. For 24 hours the supply of fluids was greatly reduced; the highly concentrated urine irritated the bladder, adding severe pain on micturition to the patient's other urinary troubles. The pollakiuria was not one whit the better for this treatment, which was promptly abandoned. The treatment which was then adopted, and which proved highly successful in both cases, consisted of repeated distension of the anæsthetised bladder by increasing quantities of fluid. First an intravesical injection of cocaine was given, and then 150 g. of fluid were introduced. This treatment was repeated at first every other day, and later every day, the amount of the injected fluid being ultimately raised to 500 g., and the patient being trained to retain this fluid for increasing periods. This re-education of the bladder was completed in 15 days, and the patient was able to leave hospital after a month, by which time he no longer had to get up at night, and required to pass water only four or five times during the day. The record of the second case was also one of rapid and complete recovery. In neither of these cases was there any nocturnal enuresis, and on the rare occasions when enuresis occurred by day it was more or less a voluntary act, prompted by the semi-conscious decision to let the urine escape into the clothing rather than, by waiting for a suitable opportunity to micturate, to excite an attack of pain and spasmodic retention. Whatever the incidence of psychic pollakiuria may be, it is obvious that before this condition is diagnosed, and the treatment described is instituted, all the other possible causes of pollakiuria must be eliminated by a thorough examination.

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[1] S.R. and O., 1921, No. 865.

EXTRAPLEURAL THORACOPLASTY IN PULMONARY TUBERCULOSIS.

A SHORT monograph has recently been published by Prof. H. C. Jacobaeus and Dr. Einar Key[1] on the treatment of pulmonary tuberculosis by extrapleural thoracoplasty. The authors deal with 60 cases, in 15 of which fitness for work, and in 19 definite improvement, were achieved. In 44 of their cases there had been an observation period of at least a year and a half since the operation, and among these 44 patients there were 12 who were restored to fitness for work and freedom from symptoms, and 8 who were definitely improved. It may therefore be calculated that this operation may restore approximately 27 per cent. to comparatively good health, and may effect considerable improvement in 18 per cent. By themselves these figures may not seem very cheerful, but the results achieved well deserve the description "remarkable" when it is remembered that the patients submitted to this treatment had been completely invalided by their disease for several years. Some interesting and rather curious facts emerge from a study of these cases. The average duration of the disease in the cases which benefited from the treatment was 5·15 years, whereas it was only 4·27 years for the unsuccessful cases. This suggests that the acute case does not respond well to this treatment. In 38 cases the left side of the chest was operated on, and among the 22 right-sided cases there were only 6 which responded satisfactorily to the operation. Among the left-sided cases there were, however, as many as 18 successes. Why this should be so is not clear, but the authors note that the late Prof. Saugman and Prof. Sauerbruch's assistant, Dr. Brunner, have also found that thoracoplasty is more often successful on the left than on the right side. Again, there were only 24 male to 36 female patients, and this disparity appears in the statistics of other operators. The reason for this is still a matter for conjecture. One of the most important matters concerned with the selection of cases for this treatment is the standard by which the efficiency of the healthier lung is to be judged. Some surgeons insist on an immaculate record from the healthier lung, or they may make a concession only to such hilum disease as radiologists alone and a few talented percussionists can demonstrate. The authors were less nice in this matter; only in 14 of their cases did the healthier lung appear to be perfectly normal or the seat of only slight hilum changes. In the remaining 46 cases the X rays or the physical examination or both betrayed involvement of the parenchyma of the healthier lung, which in 28 cases was shown to be diseased by both methods of examination. Their experience has taught the authors that it is not so much the extent and localisation of the disease in the healthier lung that matters as its character. If the disease is arrested in this lung, even half the lung may be involved and yet thoracoplasty on the opposite side may be justified.

A SURVEY OF DISEASES OF THE LUNGS AND PLEURÆ.

THE writers of text-books, and even of text-books which have much merit, may go wrong in two ways: they may set up their own views to the exclusion of all others but without bringing forward the necessary justification, or they may act as impersonal compilers but discharge their task without due judgment. Many writers of the latter class abstract without discrimination, allotting each author the same space with an impartiality which does their powers of criticism no credit. In a recent comprehensive survey[1] of the subject of diseases of the lung and pleuræ the authors have chosen the happy mean between these two extremes, and they have fused their great experiences with those of the most reliable of their fellow-workers. This survey is published as No. 12 of the series of 22 volumes of the System of Medicine, edited by G. H. Roger, Fernand Widal, P. J. Teissier, and M. Garnier. With regard to the relative importance of heredity and infection, they have no doubts; hereditary immunity has never, in their opinion, been proven, and they regard as negligible the part played by heredity in the outbreak of tuberculosis. Their survey of the problem of tuberculosis complicated by pregnancy shows how different is the attitude of the French from that of the German medical profession. In France, the induction of abortion in tuberculous women is regarded with little favour, and it is considered warrantable only in very exceptional cases. The short chapter on the relation of tuberculosis to influenza shows how divergent are the opinions of various writers; whether a physician considers influenza a perfectly harmless or a most sinister complication of pulmonary tuberculosis, he will find himself in excellent company. The authors' discussion of specific treatment reveals the same diversity of opinions, and their own lack of faith in it is betrayed by their comment that the advocates of specific treatments commonly reserve them carefully for slight cases and those which show a definite tendency to spontaneous recovery. The principle, according to this view, is that of rushing to the aid of the victor. The chapters dealing with diseases of the pleuræ are short but full of valuable information, and it is interesting to note that the opinion, formed by Landouzy as early as 1881, that pleurisy *a frigore* is merely a misleading synonym for tuberculous pleurisy has subsequently been justified. Primary rheumatic pleurisy, unassociated with any articular manifestation of "rheumatism," is also regarded by the authors as a figment of the imagination, and nothing but a euphemism cloaking tuberculosis.

WE regret to announce the death on July 28th, following an operation, of Dr. Flora Murray, who was for long officer-in-charge of the Endell-street Military Hospital.

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[1] Weitere Erfahrungen über Thorakoplastik bei Lungentuberkulose. Supplement III. to Acta Chirurgica Scandinavica, 1923. Pp. 88.

[1] Nouveau traité de médecine, pathologie de l'appareil respiratoire. By Dr. M. Letulle, Dr. P. Halbron, Dr. P. Harvier, Dr. M. Pinard, and Dr. L. Ribadeau-Dumas. Paris: Masson et Cie. 1923. Pp. 596. Fr.40.

Modern Technique in Treatment.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

XXXI.

THE TREATMENT OF INFANTILE ECZEMA.

THERE is no condition where the ingenuity of the physician is more taxed than in the treatment of infantile eczema. This is chiefly because we are dealing with a symptom, not a disease, and therefore the methods employed must change from time to time if they are to meet the requirements of the condition as they arise. For this reason the treatment of eczema, either in infants or adults, is to some extent unsatisfactory, but even if it be accepted that we are only treating a symptom, a great deal can be done by proper methods to shorten the course of disease and to bring it to a satisfactory termination.

Since diagnosis must always precede treatment, it is of importance first to take under consideration three conditions; two are properly included under the heading of eczema and the third, a pyogenic infection, is often mistaken for it. This third condition is a variety of impetigo and is found in infants distributed over the buttocks and napkin area as a red moist exuding surface, at the margins of which phlyctenules may be detected, evidence of the streptococcal nature of the infection. In this type of eruption, since we know the cause, the indications for treatment are clear. Strict cleanliness should be observed, the affected parts being kept as dry as possible and the eruption treated with mild antiseptics such as boric lotion, dusting powders containing boric acid, or simple boric ointment. In exceptional cases antiseptics of a more powerful character may be required, but if the nature of the condition is correctly interpreted, the appropriate remedies will suggest themselves and do not require further consideration here.

Seborrhœic Eczema.

The varieties of eczema met with in infants are two—seborrhœic eczema and true infantile eczema. Seborrhœic eczema, in contrast to the other form, is relatively rare, and it differs further in the manner in which it yields to appropriate treatment. The eruption affects certain areas by preference, the scalp and the flexures of the arms and knees; it is also met with behind the ears. The individual lesions tend to be sharply demarcated, the distinction between healthy and diseased skin being clearly seen. On the scalp circinate erythematous areas occur and these are usually covered with greasy yellow scales. Perhaps the most definite evidence of the nature of the eruption is found in its response to treatment, for it will usually rapidly disappear upon the application of weak sulphur or mercury ointments. When the eruption is present behind the ears it may be mistaken for an impetigo, but since both conditions can be treated in a similar manner, difficulty will not arise in deciding what remedy to use in these cases.

Infantile Eczema.

The more common and more characteristic infantile eczema differs in many ways from the above-described dermatoses. In the treatment of this disease many remedies may be employed, and this in itself is evidence of the difficulty of obtaining cure. Like eczema in general, the eruption is wanting in demarcation, the edges being ill-defined and tending to merge into the surrounding healthy skin. The disease occurs during the first two years of life and is characterised by erythematous areas with vesiculation. These vesicles discharge fluid—the eruption weeps—and this fluid coagulates and forms crusts. The regions principally affected are the scalp, cheeks, and forehead, an area around the eyes and mouth being usually spared. The arms, legs, and trunk may also be involved in extensive cases. There is intense itching and this character complicates treatment because the infant, in the attempt to relieve the abnormal sensation, rubs, and thereby aggravates and prolongs the duration of the disease.

As has been pointed out above, the indications for treatment vary from time to time as the disease progresses or alters. While the actual details of treatment are thus difficult to define, the general principles are more exact and may be summarised as follows under three headings: First, the correction of any coccal invasion; secondly, the protection of the parts involved; and thirdly, the employment of remedies which have a specific effect on the disease.

The Correction of Coccal Invasion.—As in many of these cases, owing to the nature of the eruption, the skin is so altered as to become a suitable medium for coccal growth, secondary invasion with pyococci is a common occurrence. It is not possible, however, to treat the condition thus arising with antiseptics as ordinarily understood, for the result would be seriously to aggravate the eczematous process. The particular circumstances may, however, be suitably dealt with by means of the boric-starch poultice, a remedy of great value, especially where much crusting is present. The accumulation of crusts, indeed, of itself demands the use of this remedy, for it is obvious that unless all crusts are removed the ointments, or other remedies employed, cannot come into the necessary intimate contact with the diseased surfaces. The boric-starch poultice thus acts in two ways: first, in removing surface accumulations, and secondly, as a detergent, and although it is not indicated in every case, the improvement following its use under proper circumstances is considerable. To achieve its objects it should be used cold and about one inch thick; apart from these details the exact method of its application is a matter of lesser importance.

The protection of the parts affected with eczema demands consideration. Reference has already been made to the pruriginous character of the disease and to the effects of unchecked scratching. To prevent scratching some form of mechanical restraint is necessary, as, for example, pinning the sleeves to the bed or imprisoning the arms in light splints made of corrugated paper. In putting these methods into operation care should be taken to see that the comfort of the infant is not too much interfered with. Rubbing the head on the pillow is more difficult to check, but the effects of this can largely be neutralised by enveloping the head in a suitable linen cap, adjusted in such a manner that it will not easily slip. It is important to pay attention to these details, for one prolonged bout of scratching or rubbing may undo the results of days of treatment.

The application of specific remedies is perhaps the most important of all measures. In the choice of the remedy indications may be obtained from observation of the state of the eruption. Where there is much erythema lotions such as calamine lotion without glycerine may be employed. It acts largely by its mechanical effect; when applied to a skin surface the water evaporates and thus the area under treatment is cooled and the erythema and itching lessened; the powder remaining after the fluid has evaporated further cools the surface and also affords protection to it. Calamine lotion should be used neither too long nor over too extensive an area. If used too long it will cause chapping and cracking of the parts treated; if used over too extensive a surface catarrh of the alimentary or respiratory tract may be induced, with possible serious results. Ointments are more generally indicated and their use may be said to constitute the principal method of treatment. Generally speaking, only simple applications should be employed, and for ordinary purposes a mixture of boric and zinc ointments in equal parts will be found suitable. There are many cases where nothing more than this will be required. Where, however, the eruption proves rebellious, some application of a more active character is demanded, such as coal tar. Some dermatologists recommend the application of pure coal tar to the fected area, and if there be no sepsis the result of is treatment is often excellent, but it will generally found that the tar ointment to be described is eferable. Its composition is as follows: purified al tar and zinc oxide, of each two parts, corn starch d vaseline, of each 16 parts. This should be used erally, all old ointment being removed before a new plication is made. There are cases where the ndition persists in spite of these remedies, and then rther investigations must be undertaken. The ethod of feeding should be inquired into and any ror of diet rectified. The defect may often only be termined by an examination of the fæces by an pert.

Protein Sensitisation.—American dermatologists ve called attention to the possibility of protein nsitisation in infantile eczema, and have elaborated system of cutaneous tests to demonstrate this contion where it exists. As is well known, many dividuals subject to asthma have suffered from zema in infancy or childhood, and since, in certain ses at least, asthma is a form of anaphylaxis, it was ought that both conditions could be attributed to a mmon factor. The skin is scarified, the test protein bbed in, and the degree of sensitisation determined by e resulting reaction, a wheal with marked erythema œdema, which may appear within a few minutes, aching its height in about 15 minutes, being regarded positive. This method has attracted considerable tention and has, since its introduction, been vestigated by many workers. It appears to have a finite value in asthma, but in eczema it has not lfilled the earlier expectations, and may still be garded as under trial.

Conclusion.

It will be seen from what has been said above that e treatment of infantile eczema lies mainly in the use external applications; they may be used in the llowing sequence: first, simple remedies such as ric-zinc ointment, and secondly, the tar ointment, e formula of which has already been given. If the sired result is not achieved by these remedies, then a mplete investigation into the diet of the infant should undertaken, including an analysis of the stools. In all cases aggravation by trauma should be arded against and the use of soap and water to the fected parts avoided. The favourable progress of y case will largely depend upon attention to details. e intractable nature of many forms of the disease acknowledged, but this should not lead to halfarted methods. Where the disease is vigorously tacked it will often be found to respond to the methods ployed.

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Special Articles.

PROBLEMS OF ACCLIMATISATION.*

By ANDREW BALFOUR, C.B., C.M.G.,
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Generative Functions and Growth.

In a consideration of this kind the effect of a tropical climate on the generative functions is naturally of great importance. In both male and female there is greater generative vigour in the tropics, but excess in venery is more speedily followed by exhaustion and neurasthenia than is the case in temperate climates. Puberty is attained at an earlier age in the tropics, and in European girls living under tropical conditions menstruation begins about a year earlier than would be the case in a temperate climate. Race, however, is said to play a more important part than climate in the acceleration. Hot climates may upset the menstrual cycle in white women. According to Mackinnon,[38] they sometimes shorten it and increase the menstrual flow. The same author thinks there is some evidence to show that intermenstrual periods are more uncommon in the tropics. In the case of white women arriving in the tropics menstruation may cease for a space to become re-established later. There is little evidence available regarding the effect on the menopause, but it does not appear to be altered.

Leonard Hill states that tropical atmospheric conditions lessen the fertility of European women, and Sir Harry Johnston,[39] speaking of Jamaica, draws attention to the tendency of white women in the tropics to bear fewer children. This is the case, but it is difficult to determine how far climate alone is to blame, as several factors are doubtless concerned. There can, however, be no doubt that life in the tropics does throw a very considerable strain on the generative system of women, though how far this is likely to affect the race springing from them we have at present no means of actually determining.

It is interesting to note that Lenz,[40] writing in 1921 on the phylogenic neurasthenia in East African natives, expresses his belief that the act of will depends upon a hormone supplied by the germ glands and that a tropical climate checks its development. This, of course, is only a hypothesis, but it is significant that more and more observers are directing their attention to the endocrine glands in their endeavours to explain some of these climatic effects.

Turning now to the question of growth, the stimulating effect of tropical conditions upon the machine is only too evident. Growth is as a rule rapid, but is unaccompanied by increase in weight and strength. Hence the "weedy" European child so common in the hot moist tropics. It is more than likely that the heat acts by stimulating the sympathetic nervous system which controls the functions concerned with growth and nutrition.

The Nervous System.

Such a consideration leads us finally to the changes induced in the nervous system itself. As has already been said, it is on this system that the chief stress of a tropical climate falls, and this is the system which presents the greatest barrier to white colonisation. Do what you will in the way of abolishing disease and in improving living conditions, you cannot altogether shield the delicate nervous system from the effects of heat. Out of doors, of course, the brain and spinal cord can be protected, and it should be noted that Leonard Hill and Argyll Campbell,[41] in a recent paper on heating of the tissues of the body by light and heat rays, have confirmed the utility of helmets and spinal pads by showing that local heating may occur. Again, the eye can be suitably guarded against heat and glare. Indeed, I have known some men so convinced that the eyes were the vulnerable spots, that they thought nothing of going about bareheaded in the hottest weather so long as they were wearing tinted glasses. What is more, they did so with impunity, but they had good heads of dark hair. There is, however, the whole network of peripheral nerves to be considered, and presumably in the case of white field-workers the heat must affect these in some degree. At first tropical heat stimulates, but the stimulation is followed by depression, and if this depression be exaggerated we get the neurasthenic condition so often associated with loss of memory. Here and there mention has been made of the kind of thing that happens. Cook,[42] writing of Uganda, has detailed the symptoms he has noticed in the case of old tropical residents and missionaries: such as tachycardia with a pulse unduly sensitive to posture, increased knee-jerks, sleeplessness, and reaction to small stimuli, as, for example, starting at a sudden noise. All this is evidence of nervous irritability, like the "Punjab head," "Bengal head," and "Burmese head" of the East. I have noticed that what may be called a delayed or interrupted form of cerebration is far from uncommon in the hot weather, while a more serious sign are those outbursts of passion induced by some trivial cause and which Plehn regards as being due to a weakening of control of the higher centres over the lower. There can be no doubt that with marvellous celerity the mole-hill becomes the mountain. Very hot, dry countries are those which try the nervous system, more especially if they are plagued with high winds, and women and children in particular suffer. Indeed, as regards European children in the tropics generally, it would seem that their nervous systems are in a state of unstable equilibrium, so that, quite apart from illness, fretfulness and peevishness are common and a condition approaching hysteria may even be encountered. One is inclined to regard such manifestations as of serious import for the welfare of the race, and the mothers suffer with the children.

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* The second of a series of lectures, delivered at St. Bartholomew's Hospital on June 14th under the auspices of the Academic Council of the University of London. The first lecture appeared in The Lancet of June 30th, and the preceding portion of the second in The Lancet of July 14th.

General Metabolism.

So much for the different systems. Let us glance for a moment at the question of what we may call general metabolism. As far as differences in temperature are concerned, climate has never been regarded as altering to any extent the metabolism of man, but in 1920 de Almeida,[43] a Brazilian physiologist, declared as a result of direct observations that the inhabitants of warm climates, both white and black, have a much lower basal metabolism than that of persons living in cold or temperate regions. For whites he placed it at 30–35 calories per square metre of body surface per hour and for negroes at 32·86, whereas the average in temperate climates is 39 with a maximum variation of ± 10 per cent. in normal persons.

This lowering of metabolism was thought to represent an adaptation to local conditions, and to constitute an advantage in the struggle against high temperatures, there being a diminution of the usual heat production which attends chemical cell activity. If de Almeida is right his findings are significant, but it would seem he is in error, for the Dutch hygienist Eijkman [44] has repeated in Java work he previously carried out, and has confirmed his former figures, which were in the neighbourhood of 40 calories per hour both for white and coloured persons. In favour of the Brazilian's view, however, Cohen,[45] of Philadelphia, has cited the pioneer work of Mayer on the blood, to which reference has already been made, and which indicated a lessened oxidation of tissues in tropical countries. Here again, then, we see discordant results and contradictory views, though it would seem that basal metabolism is not lessened and that the body temperature is regulated by the greater eliminative activity displayed.

With so many knotty questions to be solved it perhaps surprising that, until recently, physiologis in temperate countries had done so little in the wa of research into the climatological physiology of ho countries, employing experimental animals. Suc inquiries, it is true, can only supply an indication what may occur in the case of white settlers in th tropics, but they are likely to be useful and give lead for the carrying out of anthropological investigations on the spot. It was a conception of this kin which induced Sundstroem[46] to apply himself to hi studies on the adaptation of albino mice to an art ficially produced tropical climate. It is unnecessary t describe his experiments in detail, but it may be sai that the diet was carefully controlled. The record ca be found in the *American Journal of Physiology* fo 1922, and I am greatly indebted to Dr. A. G. Bagshaw for kindly directing my attention to it. Sundstroem set out in the first place to test the effect of the variou factors composing a tropical climate on the growth an fertility of mice. He compared the growth of mice tha had either been brought into a hot room at an earl age—as a rule at 3 weeks—or were born in tha environment, with the growth of mice kept continuously at ordinary room temperature. The rôle of ligh and of air circulation was also studied. The tropica room was kept at an average temperature of 89° F the wet-bulb temperature being 82·2°. Unfortunately a kata-thermometer was not employed Mazda globes formed the source of light both in th hot and the control rooms, and the radiation from these per se was found to produce physiological effects About 1000 animals were used. They were bred to th fourth generation and the growth studies were continued to the twentieth week. I have tabulated th results, which, in Sundstroem's paper, are expressed i tables and curves.

1. Exposure to artificial light at ordinary room temperatur accelerated the growth of mice, especially of those born i that environment.

2. A stagnant hot and humid atmosphere retarded th growth of mice which were transferred to their new environment immediately after separation from their mothers—i.e. when 3 weeks old.

3. Succeeding generations of mice born in the hot and humid environment behaved differently. The first generation may develop normally, the two following may show th greatest effect of the hot climate, at least so far as growth is concerned. The effect was evidenced by an abolition of th initial stage of comparatively rapid growth while the whol curve remained low, especially for females. The fourth generation was not observed beyond the seventh week, but i exhibited a considerable rise in the growth curve, which Sundstroem believes may signify a racial adaptation.

4. Exposure to artificial light in humid heat was found t enhance the retarding effect on growth. If, however, th hot and humid air was thrown into movement the unfavourable influence of the tropical environment on growth was partly neutralised.

5. The growth of male mice was less retarded by an unfavourable environment and more accelerated by climatic factors stimulating development than the growth of females The author comments on the fact that women suffer more from heat in the tropics than do men. Hitherto, as I have indicated, this has been supposed to be due to their indoor life and avoidance of the sun, but possibly some other explanation must be sought.

6. When the fertility of a mouse colony was normal it was not necessarily lessened by confinement in humid heat for fou generations.

Attention was also directed to the relation of the body form, and especially the surface area, to the reactions released by and the resistance to a tropica climate, and it was found that retardation of growth by increasing body-surface area may serve in a tropica climate to combat overheating of the body, and tha mice may, through an enlargement of their ears and tails, further improve their cooling mechanisms. Here is definite evidence of bodily adaptation, and it is possible that it also occurs in man. The Australian is certainly evolving a lengthy spare type, not unlike the typical American who, let it be remembered, has to live through hot summers even in the Norther States; a type quite distinct from the classical form

John Bull. Mice modified as above mentioned were und to have acquired a greater resistance towards eat.

Observations on the effect of the artificial tropical imate on the growth and pigmentation of hair and ie dependence of these integumental functions on the mperature coefficient are recorded, but we need erely note the fact that the hair of recessive albino ice, when exposed to humid heat or to the radiation strong light, acquired the power of producing gment, and the suggestion that the optimum temerature for pigment production appears to fall within ie range of tropical heat.

The author found no evidence that retardation of owth is due to an excessive amount of the thyroid rmone in the blood, but suggests that a tropical imate may, at least for mice, lessen the demand for yroid hormone in the body. Here again we have ie endocrine gland question cropping up, and it is ear that the whole problem of internal secretions they may affect life in the tropics is worthy of tention.

Finally the effect of humid heat on the blood orphology of mice was studied and it was found iat—

1. Progressive changes in the direction of an increase of the imber of erythrocytes occurred in those mice which for the eatest part of their life or since birth had been confined in imid heat. It is suggested that this change is primarily ie to inspissation of blood.

2. Progressive diminutions of the white count occurred in number of generations of mice which were reared in humid at. It is suggested that this change was produced by high nsitivity to an increase of temperature exhibited by organs ncerned in new formation of white blood cells.

In view of Grober's [24] work on men in the desert ie is inclined to ask if the red cell increase may not ve been due to the stimulating effects of light. It ould have been better, had it only been feasible, to nploy sunlight instead of electric light, but it will, think, be admitted that the results obtained are at ast suggestive. They do not, however, aid us as gards the effects of climate on the nervous system, iich appears to me to be the crux of the whole estion. In this country the chief physiological work ving a bearing on the subject under discussion is that rried out by Leonard Hill[41] and his collaborators on man subjects. It has, of course, had to be limited the effects of humidity, heat, and light on the dividual rather than the race, and has been largely ncerned with questions of safeguarding health and curing comfort. There is much of interest to the pical hygienist in Part II. of Prof. Hill's "Science Ventilation and Open-Air Treatment," wherein ference is made to the work of Shaklie in acclimatising nkeys to the sun in the Philippines, such acclimaation depending on an increased sensitivity in and iciency of the sweating mechanism. One would fain ger over some of the physiological results, for they at present the only beacon-lights which may guide to the haven of certainty, but time is limited and fore summing-up the evidence available and saying nething about preventive measures and the future tlook it is advisable to consider briefly the pathoical effects exerted by a tropical climate per se on white sojourner.

Pathological Effects.

So far as these are represented by nervous ailments must be admitted that the boundary line between ysiological and pathological effects is ill-defined. do not know if demonstrable changes are induced the nerve tissues. Little opportunity is afforded for servation upon this point in man, and only a skilled urologist could decide the question. Insomnia, wever, may be regarded as a pathological symptom. is due to heat and excessive atmospheric humidity. ngestive disorders, affecting especially the liver and wels and usually of a transitory nature, are probably ised by sudden changes of temperature. Concention of urine may give rise to some renal irritation, ecially in the newcomer, but there is no evidence t tropical climates damage the kidneys in any way. On the contrary, they are usually beneficial, lessening the strain on renal tissue. Tropical light may produce pathological effects on the skin, such as are seen in xeroderma pigmentosum and in cases of severe erythema, blistering, and œdema, but none of these conditions are of much significance, nor is the conjunctivitis which Finny[47] attributes to the light or actinic rays. Indeed, apart from heat exhaustion, heat-stroke, and the sudden coup de soleil, which will not here be considered, we must admit that the actual pathological effects of a hot climate are few and far between.

General Considerations.

It has been impossible for me in two lectures to go very deeply into a subject on which quite a formidable literature now exists, but I have endeavoured to give you some idea of the work which has been accomplished, the views at present held, and, it is to be feared, the complexity of the problem. I confess that one is tempted to echo the plaint of de Langen and Schut,[26] who stated that a study of the literature had revealed to them "a number of hypotheses in chaotic disorder, without proofs and without a leading idea being manifest in the various considerations." And yet I am inclined to consider them a trifle pessimistic, perhaps because their own and subsequent investigations have cleared the air a little. There can, I think, be no doubt that with due care, and provided the hygienist comes to the rescue in the way of providing a healthy environment, the individual white settler, man, woman, or child, can at the present time exist perfectly well under tropical conditions, and enjoy a fair measure of health for considerable periods at a stretch. It would seem, moreover, that a certain proportion of white men and a few white women can carry on active outdoor life in tropical heat year in and year out without much detriment to their physical and mental vigour.

Even in unhealthy surroundings it is remarkable what can be accomplished nowadays in the case of white children, as Bercovitz[48] demonstrated at Hainan in South China. This island is very hot, and there is a liability to abdominal chills owing to the sudden breezes which spring up. Moreover, the place is very unhealthy, malaria, hookworm, and dysentery being rife. Fresh cow's milk is not obtainable. It is said that a white child cannot play outside between 8 in the morning and 5 in the afternoon owing to the intense heat. Yet by the provision of roomy, well-ventilated houses, proper screening, and ceaseless skilled medical vigilance, with coöperation of the mothers, it has been possible during the last seven years to rear 16 children born to American missionaries. These children are described as healthy. Still, be it noted, there is one proviso—a yearly change to a cooler climate for both mother and children in order to restore vigour. There one has it—an exhausted nervous system, despite all the protection afforded. Again, is it not significant that the Annual Report of the Dutch Indies Medical Civil Service for 1920, published in 1922, states that out of 189 cases of disease on account of which leave was granted, no less than 111 were examples of psychoses or psycho-neuroses?

Hence, though I would like to keep an open mind, and though at one time I was inclined to think that the balance of evidence was on the side of Gorgas[illegible] and his school, I am not so sure, after a course of Huntington,[9] and, as a result of personal experience, that my mental pendulum is not swinging in the direction of Sir Havelock Charles and those who agree with him, and this even as regards the question of continuous prolonged residence in hot climates for the individual, at least in the low-lying tropics and under existing conditions.

So far as the race is concerned, I am persuaded that the hot and humid tropics are not suited to white colonisation and never will be, with our present knowledge, even if they are rendered as free from disease as England. As to the dry tropics and elevated lands within the tropic zone, I would not like to hazard an opinion. Remember that it was not until the fourth generation that Sundstroem's mice showed possible signs of adaptation. Like Mr. Asquith and Dr. Steudel [1] we must wait and see, but I confess that I recall with foreboding what Havelock Charles [50] has said about the deterioration of various strains of domestic animals and even vegetables introduced from Europe to India. I only wish for once in a way I had the cheery optimism of the man who, having heard that ravens lived to be 200 years old, bought one to see if it was a true bill. In, say, 150 more years of life one might come to valuable conclusions regarding Kenya and North Queensland.

It is, however, more profitable to consider if anything can be done to favour acclimatisation, apart from dealing with insect-borne and other diseases, and beyond considerations like those involving suitable clothing, suitable habits of life, the use of fans, and so forth. By the way, we are inclined to think that we have discovered the true value of all these aids to comfort, but here is what the ingenious Dr. James Johnson [51] wrote in 1813, when comparing conditions in the West Indies with those in Bengal.

> "With respect to officers, and other genteel classes of society, on landing in the Western world, they are destitute of many powerful shields which are pretty generally interposed between Europeans in the East and the burning climate. In the former case, we may look in vain for the palankeen, the budgerow, the punka, the tatty, and the light, elegant, and cool vestments of India, together with the numerous retinue of domestics, anticipating every wish, and performing every office that may save the exertion of their employers. The untravelled cynic may designate these luxuries by the contemptuous epithet of 'Asiatic effeminacy'; but the medical philosopher will be disposed to regard them as rational enjoyments, or rather as salutary precautions, rendered necessary by the great difference between a temperate and torrid zone."

His whole chapter on personal tropical hygiene is well worth reading. But to hark back to hygienic measures on the big scale: The provision of good and palatable food in abundance and presenting sufficient variety is of primary importance and will in part form the theme of my next lecture. I have been wondering if the comparatively excellent dietary available in Mauritius has something to do with the retention of vigour by its white inhabitants. Housing and town planning on scientific lines must receive attention. Guiteras [52] suggests that one reason why the Spaniard has fared better in the tropics than other Europeans is because he knows how to house himself. Certainly he contrives to keep his house cool and dark, but unless he possesses a fan or punkah he lives in a stagnant atmosphere, as he closes his windows and has no other means of ventilation. I am inclined to think that the methods advocated by Crossland [53] are better, at any rate in places where a breeze is obtainable. His experience was chiefly gained on the stifling Red Sea littoral, and he has recommended the provision of sliding louvred shutters inside the glass frames of the windows and sliding doors louvred at the bottom so that, the slats being set at an angle of 45°, the wind is deflected upwards by them and reaches the face and body of anyone seated in the room, thus making for coolness. I note that Hewetson [54] is strongly opposed to the one-storied bungalow, and I agree with him that, wherever possible, it is advisable to get away from the ground. The best tropical house in which I have ever lived was that once occupied by the German medical officer of health at Dar-es-Salaam, and it possessed two stories.

It is, however, scarcely necessary to consider details. We know how to build cool houses suitable for the tropics, though very often we fail to do so, partly because they cost money. Even so, with careful orientation, choice of material, and good design, the best house is only relatively cool. But while the architect has gone as far as he is likely to get, the engineer is far from being at the end of his resources. Air conditioning, as it is called, developed chiefly in America, is a process of so-called "weather manufacture" which is bound to progress. Hitherto it has been chiefly applied to industrial buildings, but it has been used in connexion with laboratories and hospitals in the United States. It is not only a question of cooling air but of dehumidifying it. Indeed, so long as the atmosphere to be treated is under control—that is to say, in a confined space—it can be altered to suit requirements. Of course, such a system requires a large plant, and is costly. In the tropics it could only be applied generally in towns and cities, but there seems no reason why in the future such a system should not be adopted. One would not aim at uniformity of temperature even indoors, for what is required is change within reasonable limits but surely this is not beyond the genius of the engineer to compass! We may look forward to the day when there will be a central station which will provide cool, dry air to European dwellings, the latter being provided with regulators so that whatever temperature and humidity is desired can be obtained. Chill must of course, be avoided. For isolated houses, the compressed-air douche advocated by Prof. Hill [55] may yet be feasible. It would mark a great step in advance. Moreover, as transport conditions improve there will be large and periodical movements of people from hot, low-lying regions to cool uplands which are attainable in many parts of the tropics. The change from the plains to the hills means much in India, and a similar change should yet be possible in many other places, not only for the wealthy but for all classes of the white sojourners in hot countries. People have yet to learn that prevention is better than cure, and what huge sums can be saved in hospital upkeep and devoted to better and saner purposes. Time lost through illness and inefficiency means money wated, and there has yet been little organisation of public health on a communal basis in the tropics.

Can we alter climate as well as defeat it in some measure? Who can say? We are only beginning to realise what electricity can accomplish, and, as I have hinted, it is conceivable that by its powers we may be able to bring about much-needed and welcome local reductions in temperature. Stranger things have happened, though at present it may seem a vain dream. As Hintze [56] says, there is a great future for mechanical means in the tropics. The white settler should drive machines rather than do work with his own muscles. If so, however, he must not neglect the necessary daily exercise. Much can be accomplished by more careful selection of those destined for the tropics, by choosing suitable sites for first settlement, by regulations as regards the time of marriage, by general forethought and foresight. At present we are haphazard in our arrangements and suffer accordingly.

Above all, there is the need of stimulus—not necessarily climatic in nature. Almost any stimulus is good provided it is not alcoholic. There is the necessity for work, contact with other races, idealism as to the future, and so forth. There is a hygiene of the mind as well as of the body, and methodical and systematic intellectual exercises will do much to prevent mental staleness and brain stagnation. It is interesting to speculate as to what the influence of broadcasting will be in this direction. It should diminish the sense of isolation, it should lend interest to life, it should quicken and revivify the cerebral centres.

If all these measures fail to render the white race more than sojourners then there is nothing for it but the half-breed, an adaptation not perhaps to be desired, but which has undoubtedly done much for tropical South America and which is possibly Nature's way of overcoming the difficulty. Yet in many directions Science has conquered Nature, so why should it fail in this particular, complex though the problem be? I began with Huntington.[9] Let me end with him, for he ends on a high and hopeful note. "Hitherto," he says, "we have attributed our failure to economic conditions, to isolation and remoteness, to racial incapacity, or to specific diseases. Now e see that it is probably due in part to lack of ıergy or other unfavourable effects produced irectly upon the human system by climate. There no reason for despair. We ought rather to rejoice ecause, perhaps, we may correct some of the evils hich hitherto have baffled us." And again: "The imate of many countries seems to be one of the reat reasons why idleness, dishonesty, immorality, upidity, and weakness of will prevail. If we can nquer climate the whole world will become stronger ıd nobler."

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MEDICINE AND THE LAW.

COCAINE TRAFFIC AND LONG SENTENCES.

THE record of Edgar Manning, 37 years of age, entenced to three years' penal servitude recently at he Old Bailey for having in his possession cocaine nd opium smoking instruments is instructive. It ıows the type of experienced criminal with whom the olice have to deal, and the lure exercised by the ocaine trade with its high profits, combined with the ifficulty of detecting offenders. Manning, it was ated, came to this country from Jamaica. In 1920 e received a sentence of 16 months' imprisonment r shooting at and injuring other men in a restaurant, nd at that time was trafficking in drugs and living on he immoral earnings of a woman. In 1922 a man died ı Manning's flat from an overdose of heroin, believed, o doubt rightly, to have been obtained from him. n 1922 he was sentenced to six months' imprisonment r the possession of opium and cocaine after being rrested in the house of a Greek woman also carrying n business in cocaine. A woman had died in 1922 om taking drugs believed to have been obtained from im. The police stated at the Old Bailey that Ianning used the drug himself, while supplying it to thers. It is difficult to see what can be done with a ıan of this class beyond keeping him out of mischief in rison.

A BEDRID CRIMINAL.

At Lewes Assizes Mr. Justice Avory sentenced to ix months' imprisonment in the second division eorge Tebbutt, aged 53, who was carried into court n a stretcher and laid on a table in front of the judge. Ir. Justice Avory had already resisted all appeals ıade on the ground that the man was in such a state f health that to bring him up for trial would be fatal, nd the magistrates who committed him had taken the vidence in his bedroom at his house. Tebbutt was sentenced protesting that his period of imprisonment would kill him, and there is no doubt that to laymen, at all events, his appearance was that of a man at the point of death. Nevertheless, it has been reported that when carried out of court he was able to raise himself and to bid a smiling farewell to his friends, and his case, which is certainly of an unusual character, should be of some interest to the prison medical authorities. His offence was the systematic obtaining of goods on credit without disclosing that he was an undischarged bankrupt, and the notepaper on which he wrote elaborate letters ordering the goods bore the motto "Audaces fortuna juvat"!

LIBEL ON A MEDICAL REFEREE.

At the recent assizes at Durham, before Mr. Justice Greer and a special jury, Dr. S. W. Plummer recovered £100 damages and costs in an action for libel against five officials of a miners' lodge, contained in a pamphlet circulated by them among the lodges of the Durham Miners' Association. The printers of the pamphlet were also defendants and apologised, pleading ignorance of its contents. The pamphlet was directed against Dr. Plummer in the performance of his duties as medical referee with regard, in particular, to a report made upon a young miner whose wrist had been injured in an accident. Dr. Plummer had reported inter alia that the lad had a permanent disability and "is unable to make full use of his left hand and his condition is such that he is fit for employment as a pony putter, but he could not do heavier work which involved the full use of his left hand." According to the defendants' contention pony putting was the heaviest work in the mine, and the pamphlet, after accusing the plaintiff of lack of practical experience and of making a "ridiculous" report, concluded "we respectfully ask your members to help us to turn this man off the medical referees' list." These concluding words were held by the judge to be for the jury's consideration as evidence of malice, and he therefore allowed the case to go to the jury, after having ruled that the occasion of the publishing of the pamphlet was privileged. Dr. Plummer is to be congratulated, and it seems hardly necessary to add that it is a grave hardship upon medical referees that attacks of the kind described should be made upon them by parties displeased with their reports, whether such parties be workmen or their employers.

INTERPRETATION OF SKIAGRAMS.

In an action for damages for negligence a plaintiff at Birmingham Assizes, who had been injured by a motor-van, was stated to have suffered from a fractured skull. Photographic prints were adduced as evidence in support of this when a question arose as to what these revealed. A medical man, called on behalf of the plaintiff, gave evidence that they showed a fracture of the skull. Another medical man, a radiographer, was of the opinion that no fracture was proved by the illustrations, and that the lines pointed to as indicating fracture were blood-vessels. He also spoke of the difficulty at times of drawing correct deductions from such photographs. The jury eventually awarded the plaintiff £350 damages, so presumably they preferred to rely on the evidence of more serious injury, but, of course, the views of a jury are not conclusive as to scientific evidence. The point is interesting as showing that photographs that are at all obscure should, if possible, be supplemented by fresh negatives.

RESEARCH ON PARASITES OF THE COTTON PLANT.—The Empire Cotton-growing Corporation has offered to the University of Manchester and three other institutions for a period of five years a grant to promote study of and research in mycology and entomology, with particular relation to diseases caused by animals and plant parasites of cotton. The Council of the University has accepted the offer and has appointed Mr. Samuel Wilkins, M.Sc., to supervise the department of plant diseases, and Mr. R. A. Wardle, M.Sc., to supervise investigations in entomology.

TUBERCULOSIS.

Annual Report of King Edward VII. Sanatorium, Midhurst.

On the cover of this report, which deals with the period July, 1921–July, 1922, it is stated that the charge per week has been reduced as from April 1st, 1923, to 4 guineas. This is most satisfactory and greatly to the credit of the persons concerned. Some instructive figures are published with regard to sputum tests. Of the 363 patients whose sputum was examined, 271, or 75 per cent., proved to be sputum-positive, and a comparison of the naked-eye appearance of the sputum with the microscopic findings showed that when typical, purulent sputum was examined, tubercle bacilli were demonstrable in 93·5 per cent., whereas they were found in only 17 per cent. of the watery, poor samples of sputum. Among the 271 sputum-positive cases there were 227 in which tubercle bacilli were found at the first examination, 26 on the second examination, eight on the third, and ten on subsequent examinations up to the twelfth. The interesting calculation is made that if, in a suspicious case of tuberculosis, three examinations of the sputum for tubercle bacilli yield negative results, there still remains roughly a 1–27 chance that the bacilli may be discovered on subsequent examinations during the following three months. Some of the most modern methods for treating tuberculosis in a sanatorium do not seem to be in favour at Midhurst, and the table of cases treated by artificial pneumothorax in the period under review deals with only four cases. Apparently one of the contra-indications to this treatment at Midhurst is the prospect that the patient may be unable to have "re-fills" after leaving the sanatorium.

Annual Report of Vejlefjord Sanatorium, Denmark.

The twenty-third report of Vejlefjord Sanatorium covers the period Jan. 1st–Dec. 31st, 1922, and opens with a brief obituary notice of Prof. Saugman, the creator and presiding genius of the sanatorium. Of the 145 patients discharged from the sanatorium during 1922, 129 were suitable for statistical investigations. About 56 per cent. were in the third stage, and 31·9 per cent. were confined to bed. The average duration of treatment was 208 days, and 48, or 37 per cent., of the patients were febrile on admission. Of these 48 patients, 39, or 81 per cent., became afebrile after an average interval of 50 days. Of 23 patients whose maximum rectal temperature was between 37·8° and 38° C., 21 became afebrile after an average interval of 34 days, whereas of 20 patients, whose maximum rectal temperature was between 38·1° and 39° C., 14 became afebrile after an average interval of 64 to 65 days. Some explanation for these remarkable results may be found in the section of the report dealing with the various methods of treatment adopted at Vejlefjord. Of the patients discharged in 1922, 40 were selected for pneumothorax treatment, which in 17 cases had to be abandoned on account of pleural adhesions. Fourteen underwent thoracoplasty, and one apicolysis with fat transplantation. Fifteen were treated with quartz-mercury light, and 31 with carbon arc light. X ray treatment of the spleen was undertaken in five cases, and local, Finsen-Reyn light treatment or Bacmeister's combined X ray and quartz-mercury-light treatment was given occasionally. Heliotherapy was given only in three cases, and these were, presumably, cases in which the disease was mainly surgical tuberculosis. An item of news which does not appear in this report is that Dr. Gravesen, a former assistant of Prof. Saugman's, on whom his mantle has fallen, was reading a paper on the surgical treatment of pulmonary tuberculosis on July 25th at the annual meeting of the British Medical Association.

The Grancher System of Infant Prophylaxis: Five Hypotheses Relating to Tuberculosis in Infancy.

A paper by Léon Bernard and Robert Debré in *Annales de Médecine* for May, 1923, gives an instructive account of the elaborate organisation established in Paris for isolating infants at birth from tuberculous surroundings. The expectant tuberculou mother is confined in some maternity hospital with which the central tuberculosis organisation coöperates The mother is instructed beforehand as to the fact of the situation, and her consent is obtained for th removal of her infant directly after birth. Even when only the father is tuberculous, it is usually desirable to remove the infant at once to uninfected surroundings unless the father leaves the home to enter an institution for the tuberculous. If he doe not, and the healthy mother attempts to combine wage-earning and the care of her infant, the odds are that it will suffer.

Prof. Bernard and his collaborator enunciate five hypotheses—laws, they prefer to call them—dealing with the pathology of infection with tuberculosis in infancy. The first three are fairly well established the two last are at any rate very interesting and suggestive. (1) The fate of the infant depends on its age at the time of infection. Of five infants, less than 15 days old when removed from exposure to infection, all died, whereas of 41 between the age of 6 and 18 months at the time of removal, only 10 died. (2) The next most important factor is the duration of exposure to infection. The authors compare the duration of such exposure among 33 infants who escaped contamination with the duration of exposure of 86 infants who were found to be contaminated, and the figures published show that, as a rule, the longer the exposure, the higher the rate of tuberculosis among infants. (3) Intimacy of contact also plays a part, and the authors refer to statistics published elsewhere in support of this hypothesis. (4) There is a definite relation between the gravity of the disease in infancy and the duration of the "ante-allergic" period—the incubation period or interval between the moment when exposure to infection ceases and the cuti-reaction becomes positive. The shorter this period, the more serious is the disease. (5) There are exceptions to this fifth law, but they are not common enough to invalidate it. It concerns the duration of life of the infant after exposure to infection has ceased. The authors have never observed an infant who lived for six months after exposure to infection ceased and then died of the disease. Of 36 infants dying of tuberculosis, 30 died within a month of isolation from infection by a mother or father, one died two months after isolation, one four months after, and one five months after. In other words, an infant who is still alive a month after removal from an infectious parent has excellent chances of survival.

UNITED STATES OF AMERICA.

(From an Occasional Correspondent.)

Industrial Hazards of Children.

A recent report by the Bureau of Women in Industry drew attention to the frequency of accidents to children who are employed in defiance of the law. Thus in a single year 44 children were found to have suffered injuries, involving at least a fortnight of invalidity, none of them being of the legal age in their respective employments. One boy of 11 had his hand crushed while operating an electric ice-cream freezer; another boy, only a year older, lost two fingers in feeding meat into an electric chopper. A Bill designed to prevent this illegal employment of children has been introduced into the New York State legislature. If passed it will provide double accident compensation and double death benefits for all children illegally employed.

Since July 9th a large force of New Jersey State inspectors have been investigating the conditions under which home industries are carried on. It appears that the distribution of work by New York manufacturers has been growing to very considerable proportions.

t only is the matter of child labour involved here—
d many quite young children are found to be
rking—but the sanitary conditions of these home
tories are sometimes found to be very deficient.
. Charles A. Weeks, Deputy Commissioner of
bour for New Jersey, states in an interview that his
tention has been called to several pathetic cases
ere parents living in Jersey City and Hoboken have
n working long hours in dingy, ill-lighted, and
sanitary rooms, and that in some instances children
rdly old enough to handle the work have been
essed into service. Legislation in this case is
necessary since the New Jersey State law provides
penalty of $50 for the unauthorised use of private
oms for homework of any industrial nature. The
v further provides that rooms so used shall have no
or, window, or other opening into adjoining living
oms, and that these rooms shall not be used at any
ne for living, cooking, or sleeping purposes.

Medicine in Industry.

The annual meeting of New York health officers
s held during the last week of June at Saratoga
rings. A thoughtful address on the principles of
alth supervision in industry was given by Dr.
rnard L. Wyatt, director of the Laurentide Health
rvice, Quebec. The use of the word welfare in
nnexion with industrial health service is, he holds,
eatly to be deprecated. Such service must not be a
m of philanthropy or paternalism. Nor must it be
garded as a substitute for some other essential
ctor in industrial relations. The worker expects
a steady job, (*b*) adequate real wages, (*c*) a good
eman, (*d*) a voice, individual and collective, in
tling his own conditions, (*e*) a chance to rise.
dustrial health work must supplement and not
place any of these factors. It should be undertaken
t as strike insurance, but in a spirit of service;
ose who are engaged in it must remember that the
erests both of employer and employee must be safe-
arded. The coöperation of both is needed; experi-
ce has shown, for example, that accidents cannot be
evented by rules, discipline, or appliances without
e willing and earnest coöperation of the workers
emselves. As regards financial outlay, it is more
portant to start right than to start on a large scale.
the case of one firm an extensive programme of
alth supervision was organised in the brief period
eight months, and for the next three years the
ecutives were kept busy explaining why they had
t put the money into the pay envelopes of the
rkers instead of spending it as they did. The work
ist be built upon the expanding consciousness of its
erits in the minds of those it serves. The old
nception of a "plant doctor" employed to dispense
ew pills and to dress minor injuries is giving way to
conception of industrial medicine as a preventive
her than a curative branch of the art. There are
least 700,000 accidents yearly in the United States,
which not less than 78 per cent. are preventable.
ain, the recognition of the inseparability of good
alth and efficiency may be expected to result in
velopment of the preventive side. It is clearly
ort-sighted to limit one's efforts to the eight or
e ten working hours; experience has shown the
finite advantage of some concern for the home and
mmunity conditions of the workers.

In estimating the financial return of a health
vice two principles were emphasised. In the first
ce all results are not tangible; in the second place,
ile certain maintenance charges in connexion with
alth supervision are chargeable as production and
ould be passed on to the consumer, others should be
set by savings in materials, labour turnover,
senteeism, continuity of production, and the like.
e maximum of benefits will not be attained within
ree or four years.

BURNLEY AND THE VACCINATION ACTS.—The
rnley guardians have, it is stated, decided to take no
tice of the communication of the Minister of Health
ncerning the administration of the Vaccination Acts.

NOTES FROM INDIA.

(FROM OUR OWN CORRESPONDENT.)

Working of District Municipalities in Madras Presidency.

THE Government review on the working of the district municipalities in the Presidency for the year 1921–22, which has just been issued, contains, inter alia, the following information relating to medical affairs and public health activities:—

Medical Relief.—During the year new municipal dispensaries were opened at Vellore, Pollachi, and Calicut, and the hospital at Tirupati was converted into a dispensary. Two dispensaries at Udamalpet and Proddatur were closed. The councils maintained 54 hospitals and 44 dispensaries. The councils of Anantapur, Chingleput, Chittoor, Cuddapah, Mangalore, and Kurnool have no medical institutions, the towns being entirely dependent for medical relief on the district headquarters hospitals maintained by the Government or on private enterprise. The only municipalities which have no hospitals of any kind are Walajapet, Saidapet, Tirupati, Palakole, and Sivakasi. There were health officers throughout the year in the municipalities of Coimbatore, Calicut, Ootacamund, Tuticorin, and Trichinopoly.

Birth-rate.—The problem of improvement of the registration of vital statistics has engaged the attention of the Government for many years past. The defects of the present records were subjected to an exhaustive examination by the Director of Public Health, and the memorandum drawn up by him summarising the lines on which accuracy may be improved has since been circulated to all officers concerned. The births recorded by municipalities work out at an average of 30·3 per mille. Tiruvannamalai tops the list with a rate of 46·6.

Maternity Relief.—The councils employed 134 midwives, against 110 in 1920–21, as now reported, and the number of cases treated by them arose from 11,745 to 12,553, an average of 93 per midwife. In addition, 135 midwives were practising privately and attended 6080 cases. In all about 25 per cent. of births were attended to by qualified midwives. There are no midwives at all in Cuddapah and Salem, and in most councils this service does not receive proper attention, the staff employed being utterly inadequate. On the other hand, Mangalore has 21 trained midwives, nine of whom are employed by the municipality, who between them attended 75 per cent. of the recorded births; Trichinopoly employs six midwives, in addition to 20 other qualified midwives in the town, and the number of confinements which received skilled attention rose by about 65 per cent. For these good results the councils are indebted chiefly to the District Health and Welfare Association at work in these places.

Death-rate.—Public health was worse than in the previous year, the rate reported being 27·2 per mille, against 21·8. Gudiyattam and Bezwada head the list with 47 and 41 per mille respectively. The mortality figures for epidemic diseases are as follows: Cholera, 1861; small-pox, 1687; plague, 2151. As regards cholera, the towns with a protected water-supply did well. Apart from Cocanada, which had 117 deaths in a part of the town where piped water was not accessible, eight only showed a mortality of more than 20. There were in all 634 deaths from cholera in the 28 protected towns, and 1227 deaths in the remaining 52, the rates per mille being, protected 0·2, and unprotected 0·5. As anticipated, the small-pox epidemic assumed a severe form, being highest in Madura (466 deaths). Vaccination only slightly improved, the number of successful primary operations rising from 80,124 to 81,161, and the number per mille of the population from 32·0 to 32·4. Revaccinations increased from 26,797 to 28,360. Plague was less virulent than in 1920–21, the death-roll falling from 4914 to 2151. Influenza was responsible for 372 deaths, against 481 in the previous year.

Sanitation.—The conservancy charges rose by Rs.1·05 lakhs over that of 1920–21, the average expenditure being nearly As.9–10 per head. Private scavenging was self-supporting in 16 municipalities. The number of private latrines increased by 18,699, and the number of houses conserved by 17,685. These figures are disappointing.

Water-supply.—Twenty-eight towns in the Presidency possess a protected water-supply; in three towns new installations are under construction, and schemes have been sanctioned for four others. The present financial position makes it impossible to expect great and rapid progress in this matter.

The average consumption of water ranges from 51 gallons per head in Tirupati (no other town consumes more than 15 gallons per head per diem) to nearly 4 gallons per head in Berhampur and Guntur. Financially, the water-supply fund for all the 29 towns taken together shows a plus balance of Rs.0·80 lakh.

Drainage.—Only one town has a completed drainage system, and in two, Madura and Vellore, drainage-works are still under construction. Schemes are under discussion in no less than 25 towns, but want of funds is generally holding these up.

Government, in concluding their review, state that municipal councils evidently do not realise that in the depressed state of their finances they cannot afford to be tardy in the collection of their tax revenue or indifferent in remission or writing off of bad debts. Many irregularities have been brought to notice by the local fund auditors.

Relapsing Fever in Madras Presidency.

The Madras Presidency has until recently been, as far as is known, entirely free from relapsing fever, but towards the end of 1921 reports of cases began to be sent in to the Public Health Department, and eventually, on investigation, it was found that infection was widespread in certain districts. The first report on the subject was sent by the Director of Public Health to Government on Nov. 17th, 1922, and the Government have recently published the report along with their remarks. The Government review sums up the situation as follows: In February, 1922, the Presidency was regarded by research specialists as immune from relapsing fever, but in the following month reports were received of the occurrence of a new and deadly epidemic in the district of Tanjore. Relapsing fever had been widely prevalent in the Mysore State for some time past, and an outbreak occurred in the adjoining plateau taluk of Hosur in Salem district in October, 1921, but its scope was limited. The Tanjore outbreak, the origin of which it is impossible to trace, stands on a different footing. An elaborate investigation by the Public Health Department revealed the fact that this disease had established itself in the districts of Tanjore and Trichinopoly for seven months before it was detected by the authorities locally responsible for public health administration. The disease was restricted almost exclusively to the Paraiyar and Pallar communities; neither the local village officers, nor the landlords in whose service the Paraiyars and Pallars are employed, bestirred themselves to combat it, but the victims realised the character of the epidemic sufficiently clearly to describe it as "Paraiyars' fever," attributing it to the pollution of a sacred tank in Kumbakonam by a Paraiyar, and realising that its virulence could be abated by the simple expedient of shaving the head.

The Director's report establishes the following three points of supreme importance in public health administration:—

(*a*) Closer vigilance over vital statistics would have enabled the Public Health Department to take steps to stamp out the disease at its outset. The Director's diagrams show very clearly the existence in these villages of an abnormal prevalence of "fevers" in August and September, 1921, rising to a maximum incidence in the period December, 1921, to March, 1922. The report proves by corroborative evidence that this rise in mortality was due to relapsing fever, and that the worst was over before the disease was correctly diagnosed. The statistics also reveal the facts: (1) that adults of from 20 to 40 years of age are most susceptible to infection, while its incidence among very young and very old is comparatively light; (2) that women are somewhat more susceptible to infection than men.

(*b*) The impossibility of tracking down an epidemic of this kind unless the local health authority is equipped with a properly trained preventive staff. Only by intensive local investigation can the public health authorities locate the districts infected and take steps to eradicate the disease. The essential fact was that infection was confined to certain specified villages and to certain communities. The need for the appointment in every district of district health officers with a properly trained staff is amply justified, and when the complete scheme sanctioned comes into operation, it is inconceivable that so large an epidemic as that now under review can again run its course without detection.

(*c*) The third point is the importance of accura knowledge. The actual diagnosis of the cause of t trouble was made in the first instance by the examin tion of blood smears, at first in the Tanjore Medic School, but the work of a mobile unit of the Ki Institute staff organised to examine the disease in si met with a success impossible in the absence of su a unit. It is satisfactory that in the reorganisati of the King Institute provision has been made f field units as a permanent accessory to the Guind staff.

The Director estimates that out of 9060 attacks f which relapsing fever was accountable, no less tha 3382 ended fatally. This gives a mortality rate 37·3 per cent., but in some villages two died out every three persons attacked, while in a considerab number of villages infected from 70 to 80 per cen of the population suffered from the disease. I many households the whole family was wiped ou That the spread of infection is due to overcrowdin and dirty habits was shown by the almost complet immunity of the higher castes living in close proximit to infected hamlets.

Since the submission of this report the disease ha spread to other districts, and will probably graduall extend its ravages all over the Presidency. Preventiv measures, while simple, are by no means easy to carr out in a population of 42 millions, although it has bee possible in small areas to get considerable numbers both males and females to shave their heads. Th treatment of thousands of individuals living in remot villages in the mufussal with drugs like salvarsan i of course, out of the question. The position is ver serious.

Health Propaganda and Voluntary Associations.

The Government have just published an Orde which contains the following paragraphs:—

"The better organisation of public health propagand and the coördination throughout the Presidency of the wor of voluntary health associations have engaged the attentio of the Government for some time past. In a previous Orde a programme was laid down for the coördination of healt work through the medium of district health committee and with effect from April 1st, 1923, each district will hav a health officer. Practical experience has also been gaine of the possibilities of propaganda work in the mufussal b the deputation of four assistant surgeons early in 1922 o lecturing tours in a number of districts. The Director o Public Health's report attached as an annexure to this Orde is a most convincing testimony to the value of such work."

"On the non-official side the cause of public health ha been greatly strengthened by the reconstitution of th Health and Welfare Association and the distribution of it functions between two separate organisations: (1) th Health Propaganda Board, and (2) the Maternity and Chil Welfare Association, Madras, which is affiliated to the Lad Chelmsford All-India League. This association had, eve before the reconstruction of the Health and Welfare Association, greatly expanded its activities both in the mufussa and also in Madras City, working in the latter area in clos coöperation with the health centres of the Madras Corporation. The corporation health centres have now receive definite recognition as a Health Visitors' Training Schoo for the Presidency. A wide field has also been covere by the hookworm propaganda work of the Rockefelle Foundation."

"The Government have now before them two document which they hope will give cohesion and permanence t activities which hitherto have been somewhat discontinuous. The first is a 'Memorandum on Propaganda and Voluntary Health Work,' drawn up by the Director of Public Health, while the second document is a 'Memorandum on the Future Policy of the Health Propaganda Board.'"

The Director in his memorandum discusses the great need for propaganda work in the present state of ignorance and apathy of the people, and lays down a definite plan of campaign, at the same time outlining the official and non-official agencies already in existence. The third section of the memorandum describes the activities of the Public Health Department in connexion with the giving of popular health lectures. These lectures were given by qualified assistant surgeons and are reported to have been most successful. It is regretted that the small grant for this piece of propaganda work was cut out of the current year's budget. The fourth part of the iemorandum mentions the bodies of voluntary orkers, &c., at work in Madras city and in the iufussal, and discusses the various ways in which iese bodies may be utilised by a central propaganda rganisation. Finally, a detailed programme of work suggested, this programme including campaigns r prevention of hookworm, plague, small-pox, holera, malaria, tuberculosis, venereal diseases, for hild welfare and maternity relief work, &c. The ealth Propaganda Board is felt to be the body best iited to form the necessary link between the State nd local bodies on the one hand, and on the other the arious voluntary associations and societies. It is iggested that representatives of the various official nd non-official agencies should be elected to this oard, so that a more or less complete coördination ould be obtained. On the official side the Director f Public Health, representing the Public Health epartment, the Director of Public Instruction, epresenting the Educational Department, and the irector of the King Institute, representing the edical Department, should be coöpted members of ie Board.

The memorandum on the future policy of the ealth Propaganda Board, written by Major J. unningham, I.M.S., is also printed with the Government Order. This memorandum discusses a scheme r the organisation of public health propaganda om the non-official point of view, and while laying own certain general principles in connexion with ealth propaganda which require consideration before ie actual organisation of the central body can be iscussed, it reaches conclusions which are not at ariance with those promulgated by the Director of ublic Health. It is suggested that the Health ropaganda Board could best carry out its functions s the central organisation for health propaganda by ieans of two subcommittees which, for want of etter names, could be known as (1) the technical, and 2) the administrative. These two committees would i no sense be water-tight compartments, but would ork in the closest coördination with each other.

The Government do not discuss these two iemoranda in detail, but suggest that they deserve areful study. The Government admit the necessity r a central agency to coördinate the efforts of the umerous bodies interested in public health propaanda, but defer the question of financial assistance, s they understand the formation of such an agency under consideration. The recent visit of Sir Claude ill, the Red Cross Commissioner for the League of ations, has stimulated interest in the international ctivities of the Red Cross Society in public health ropaganda.

CONGRESS OF THE
OYAL SANITARY INSTITUTE AT HULL.

THE Thirty-fourth Congress of the Institute, which pened at the beginning of the week, bids fair to be xceptionally successful, attended as it is by over 500 elegates from this country and a large number of verseas representatives. On Sunday, July 29th, anon George Buchanan preached a striking sermon the members of the Congress, in which he developed ie theme that health and wholeness implied the same iing, and to secure real health every section of the ommunity and every phase of social life must be eached.

On July 30th the Lord Mayor of Hull received the iembers and delegates and later on opened the ealth Exhibition in the Wenlock Barracks, a building dmirably adapted for the purpose. At 5 P.M. the ight Hon. T. R. Ferens, High Steward of Hull, resident of the Congress, delivered the inaugural ldress, Dr. Louis C. Parkes, Chairman of the Council the Institute, being in the chair. Mr. Ferens made ecial reference to housing as the greatest need of the ation to-day. Hull needed approximately 6000 more ouses. It was no use, he said, attempting to instil the recept of hygiene into people who live in the many dilapidated and insanitary dwellings which to-day exist in the slum areas of all our towns and cities. As a contrast, Mr. Ferens invited the members to visit the well laid out garden village in East Hull, covering an area of 60 acres and containing 600 houses; marked improvement in health was the result of life there. Mr. Ferens also alluded to the social and hygienic work in connexion with a factory in East Hull, where over 5000 workers of both sexes are employed. Here, during the past 15 years, a whole-time doctor and a whole-time dentist have been engaged, and may be consulted at any time. Nurses are provided, and are in charge of dressing and rest rooms for casualties and slight illnesses. There are health visitors who become acquainted with home conditions of the workers. Boys and girls under 18 are taken from their work two hours weekly for drill and gymnasium at the company's cost. Dental work has proved most beneficial in the maintenance of general health; tooth-brushes and tooth-powder are bought wholesale and supplied at cost price. Applicants for employment are examined by the doctor as to their suitability for factory work. The medical examination is on very broad lines and rejections are few, consisting of those suffering from epilepsy, oral sepsis, tuberculosis, and certain heart cases.

At the conclusion of his address a vote of thanks to Mr. Ferens was proposed by Lieut.-Commander J. M. Kenworthy, M.P., and seconded by Surgeon W. W. King, of the United States Public Health Service, on behalf of the delegates from Foreign Governments. The motion was also supported by Dr. J. E. Sandilands, Executive Health Officer of Bombay, on behalf of the delegates from the Dominions, by Dr. S. J. Thacker, ex-Mayor of Christchurch, New Zealand, and by Judge W. J. Harvey, of Edinburgh, on behalf of the delegates from Municipal Authorities, and was put to the meeting by Mr. H. D. Searles-Wood, chairman of the Institute's Congress Committee.

The meetings of conferences and sections are proceeding as outlined in THE LANCET of July 21st (p. 152). Elsewhere in the present issue appears the text of Prof. F. E. Wynne's address, delivered before the Section of Maternity and Child Welfare on August 2nd. A large number of firms are displaying apparatus, materials, and preparations of interest to all concerned in hygiene and sanitation.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg.-Lt. H. A. L. Guthrie to be Surg. Lt.-Comdr.

ROYAL NAVAL VOLUNTEER RESERVE.

Temp. Surg.-Lt. W. F. W. Betenson, late R.N., to be Surg.-Lt. (Permanent List).

Surg.-Capt. R. J. E. Hanson is placed on Retd. List at his own request.

TERRITORIAL ARMY.

Capt. A. W. Wakefield (late Canadian A.M.C.) to be Capt.

A. H. MacCulloch Eaton (late R.N.V.R.) to be Lt.

Capt. F. E. Tylecote relinquishes his commn. and is granted the rank of Maj.; and Capt. J. Macquarrie resigns his commn. and retains the rank of Capt.

Sanitary Companies: Capt. R. Cunningham (late R.A.M.C., Mila). to be Capt.

INDIAN MEDICAL SERVICE.

Col. Charles Harford Bowle-Evans, V.H.S., C.M.G., C.B.E., has been appointed Director of Medical Services in place of Lieut.-Gen. Sir C. H. Burtchaell, C.H., K.C.B., C.M.G. This is the first time that an officer of the I.M.S. has been appointed to be Director of Medical Services, and we congratulate all concerned on the departure.

The King has approved the retirement of Maj.-Gen. Sir William Rice Edwards, K.C.I.E., C.B., C.M.G., K.H.P.

THE Lancashire Asylums Board has decided to apply under a Bill now before Parliament for the name to be changed to "Lancashire Mental Hospitals Board."

ELEVENTH INTERNATIONAL PHYSIOLOGICAL CONGRESS.

THE Eleventh International Physiological Congress met in Edinburgh from July 23rd to 27th, under the presidency of Sir EDWARD SHARPEY SCHAFER. We referred in the last issue of THE LANCET to the opening of the Congress,[1] at which were present members representing over 20 nationalities. The proceedings included a graduation ceremony, at which the honorary degree of Doctor of Laws of the University of Edinburgh was conferred on the following distinguished members of the Congress: Profs. F. Bottazzi (Naples), W. Einthoven (Leiden), W. H. Howell (Baltimore), J. E. Johansson (Stockholm), A. Kossel (Heidelberg), H. H. Meyer (Vienna), Ivan Pavlov (Petrograd), and C. Richet (Paris).

At the opening session, following the official addresses of welcome on behalf of the Government, the city and University of Edinburgh, and the President's address, Prof. J. J. R. MACLEOD, of Toronto, delivered a lecture on insulin, which we published in an abridged form in our last issue.[2] A large number of other papers were devoted to various aspects of this subject. The programme was so varied and extensive that thoughout the meeting communications had to be delivered in three lecture theatres concurrently. Physiology has now become so highly specialised that many of the subjects dealt with appealed only to a small group of experts; but there were also a large number of communications which were not only of more general scientific interest, but which had a very direct bearing on the problems of clinical medicine.

Physiology of the Nervous System.

In the sections concerned with the physiology of the nervous system the question of the possible sympathetic innervation of voluntary muscles formed the subject of several papers. On the whole the tendency of the meeting was to regard the case as not proven; several workers (including Profs. Bottazzi and Hess) reported that they had been unable to find that interference with the sympathetic system had any effect on either the tone or the nutrition of skeletal muscle. One of the most interesting demonstrations was given by Prof. R. Magnus (Utrecht) on the postural reflexes due to the labyrinth and mid-brain. Prof. Magnus showed how the balancing and "righting" reactions can be analysed into a series of simple reflexes by the use of guinea-pigs and rabbits with the cerebrum removed. The clinical importance of these reflexes has been pointed out recently by Dr. F. M. R. Walshe, and their interest for the neurologist is increased by Dr. G. G. J. Rademaker's demonstration of their connexion with the red nucleus and cerebrospinal tract. In the cinematograph exhibits Prof. G. P. Zeliony (Petrograd) sent a film showing the behaviour of a dog three years after complete removal of the cerebral hemispheres. This animal illustrated certain phenomena which had not been observed by Goltz in his classical experiment, and the central nervous system in general exhibited extreme irritability. When played with the animal behaved in the manner characteristic of a puppy, lowering itself on its front legs, wagging its tail, and continuing to run and jump about.

Prof. A. KROGH (Copenhagen) gave a very beautiful cinematograph demonstration of the capillary circulation in various organs of the body. The film itself was a triumph of technique and gave a very vivid picture of the conditions under which gaseous exchange in the tissues takes place.

Physiology and Psychology.

In a most suggestive lecture entitled "Les voies non sensorielles de la connaissance et la méthode expérimentale," Prof. RICHET dealt with the borderland of physiology and psychology. He began by warning his audience that the matter which he was about to put before them was of a very revolutionary nature and was likely to meet with vigorous opposition; bu he contended that many of the most distinguished physiologists of the past had been great revolutionaries in that they had faith in the experimental method and had rejected the theories and concepts of a those who refused to take experimentation for thei guide. His thesis was to prove by the experimenta method that there were for the knowledge of reality other channels than the normal sensory channels. I was thought that we could not comprehend reality by other means than by the five senses, that a circumstance would remain still unknown to us, if sight touch, and hearing had not revealed it. That wa the classic idea. To admit, for one moment, tha consciousness could grasp a circumstance by means other than the senses, was an idea which would be regarded as revolutionary. He suggested the hypothesis that the events of the external world could actuate our intelligence in some other way which was not at present understood, by a hidden form of sensibility which he termed "cryptesthesia." He asked his audience to consider a similar example They were not conscious of any music in the room where he was speaking. They heard nothing and could almost affirm that there were no musica vibrations there. But if they took the receiver of a wireless telegraph apparatus, everybody might hear a concert which was proceeding miles away It sufficed to get a receiver to prove that there were such vibrations in their midst. Similarly there might be ways open to our consciousness other than the familiar way of the senses. In considering such possibilities, scientific investigators should not let themselves be prejudiced by the credulity of the spiritist He would like to see the facts, which depended on observation, investigated experimentally.

Physiology of the Cardiovascular System.

In the section dealing with the physiology of the cardiovascular system, Prof. C. J. WIGGERS (Cleveland) demonstrated some very beautiful instruments which he had used for making optical records of the heart sounds in man, and of the pressure changes in the heart of animals. In a series of experiments dealing with the dynamics of premature ventricular contractions in the dog produced by artificial stimulation he had found that the volume of blood discharged from the ventricles varied with the time available for ventricular filling and with the intraventricular tension, the latter factor depending not only on the duration of diastole, but also on the rate of venous filling of the heart.

Dr. J. CRIGHTON BRAMWELL and Prof. A. V. HILL (Manchester) demonstrated a very sensitive recording instrument, the "hot-wire sphygmograph," which they had used for measuring the velocity of the pulse-wave in man. From these observations they were able to determine the elasticity of the arteries in the living body, and to investigate the variations in arterial elasticity met with in different pathological conditions. This instrument had also been employed for recording muscular tremor.

Dr. JANE SANDS (Philadelphia) showed a series of X ray photographs, illustrating alterations in the size and shape of the dog's heart, following artificially induced aortic regurgitation. Immediately after operation the heart appeared longer and narrower. Later the size of the heart shadow was increased and displaced leftwards, but electrocardiographic examination did not show any evidence of left ventricular preponderance.

Nervous Activity and Heredity.

At the concluding session of the congress Prof. PAVLOV, in the course of a paper dealing with inhibition, described some extremely interesting and important experiments on conditioned reflexes. He pointed out that in this connexion a question of the greatest importance was whether the highest nervous activity—that is to say, individual perfection—might be of use to the next generation. Was it hereditary? They had tried to find the answer to that question, nd had established the conditioned food reflexes in hite mice, using the sound of an electric bell. With ıe first set of wild white mice it was necessary to epeat the combination of ringing the bell and feeding 00 times, in order to form the well-established eflexes. The next generation formed the same eflexes after 100 repetitions, the third generation fter 30, the fourth generation after 10, and the fifth fter 5 repetitions only.

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[1] THE LANCET, July 28th, p. 183. [2] Ibid., p. 198.

Public Health Services.

THE HEALTH OF LONDON IN 1922.

Sir William Hamer's annual report as medical officer f health and school medical officer to the London ounty Council is so full of interesting matter that ur first obvious duty is to point out that copies can e obtained (price 2*s.* 6*d.*) from P. S. King and Sons, imited, Westminster. The death-rate of London as 13·5 in 1922, to be compared with 12·5 in 1921. he infant mortality rate was 75, and Sir William amer submits a table showing that a remarkable fall as taken place in the mortality from premature birth nd congenital defects during the past three years. is suggested that the replacement of the unqualified idwife, maternity benefit, maternity homes, and the ecent increasing concern for expectant and nursing ıothers have played their part in producing this esult. The boroughs which show the greatest relative nprovement in infant mortality since 1911–14 are reenwich, Battersea, and Poplar, while St. Pancras nd Kensington have lost place.

The small outbreaks of *small-pox* have been of a evere type, in contrast with the mild type prevalent ıtely in the North and Midlands. In all 65 cases were otified in London, of which 20 ended fatally, a case ıortality of 30·8 per cent. Of 5 cases, showing no gns of vaccination and in which vaccination was oubtful, 3 died, 2 recovered; of 14 unvaccinated 7 ied, 7 recovered; of 46 vaccinated in infancy 10 died, 6 recovered. The three shortest intervals between rimary vaccination and the attack were 14, 16, and 6 years respectively; the three shortest intervals etween primary vaccination and a fatal attack were 3, 44, and 49 years respectively. In 1901 the weak oot in the defence of London was the difficulty in lentifying many cases of the disease. Thanks to the esearch work of the late Dr. T. F. Ricketts that defect as now been remedied, and the services of Dr. . McC. Wanklyn, who has carried on the traditions f Dr. Ricketts, have been placed at the immediate isposal of the medical profession of London whenever suspected case arises.

Sir William Hamer deals again with the influence f the movement of the population on the *phthisis eath-rate* in London, and quotes Dr. M. Greenwood on ıe question of bringing "unsalted" (rural) populaons into contact with urban civilisation, and the onclusion of the latter that "adolescent migration erhaps increases mortality in both populations—rural ıortality by the withdrawal of those best fitted to ırvive under the rural environment, urban mortality y the introduction of those ill-adapted to survive nder urban conditions." The apparent arrest of the ownward trend of the phthisis death-rate in London n 1922 it was 1·08) which occurred about 1911 is ssociated with decrease in the emigration of phthisical ersons and with the transfer to London of deaths of ondon residents taking place elsewhere.

The report deals at length with the decline of *phoid fever* during the last 20 years and the disppearance of the autumnal rise, and gives an interestıg diagram showing the incidence of typhoid fever in our-weekly periods on the boroughs of London since 891. The main burden fell in the past upon people ving in certain poor areas from the thirty-seventh to ıe forty-eighth week of the year. The problem in ondon has now been narrowed down to examination of ıe parts played by fish and shell-fish respectively. After nalysis of the notification figures, Sir William Hamer concludes that there is little evidence of infection by cockles and mussels, and that "the London evidence, at any rate since 1891, incriminates mainly flat fish, generally plaice, almost always purchased as cooked (fried) fish, and often in an ungutted state." The first-hand evidence of hundreds of patients has been taken. The incriminated fish are immature plaice from 4 to 10 in. long which used to be brought to London from fishing-grounds near the mouth of the Elbe. In 1906 the London County Council raised the question with the City Corporation as to the need for the inspection of these small fish at Billingsgate, and since 1907 the fishing-grounds in question have been gradually abandoned by English trawlers. The decline of typhoid fever in London has tallied very closely with the disuse of these grounds as a source of London food-supply.

With regard to *venereal diseases*, Sir William Hamer comments with satisfaction on the decline in new cases of syphilis and the fact that the new cases of gonorrhœa are gradually approximating to the relative figures of 1 of syphilis to 3 of gonorrhœa, hitherto held to be the ratio of cases in the community. Other satisfactory features of the scheme are that the ratio of attendances to new cases goes up year by year and that the medical practitioners make increased use of the pathological facilities provided. There are 28 centres in London, and it is interesting to observe that 19·1 per cent. of the new cases attend the model clinic at St. Thomas's Hospital, and further that 28·3 per cent. of the attendances and 25·4 per cent. of the pathological examinations are made at this clinic. Sir William Hamer thinks that the failure to complete treatment is not so serious as generally supposed, and that the strictness of the definition of cure has given rise to erroneous impressions. He further states that there are good grounds for believing that the work done at the V.D. clinics in London will compare very favourably with that obtaining in those colonies where the system of compulsory notification and attendance is in operation.

The census of 1921 showed that the general distribution of the available *housing accommodation* was better than in 1911. "It is a very striking fact that in the majority of boroughs there has been a distinct improvement in respect of overcrowding conditions, especially in the central and eastern districts, which are largely occupied by the poorer classes."

Sir William Hamer gives a summary of a further investigation carried out by Dr. F. C. Shrubsall and Dr. A. C. Williams into the relationship between delinquency and *mental deficiency*. Full use is not made of the accommodation at St. Margaret's Hospital for ophthalmia neonatorum, and the Departmental Committee on Blindness think it would be preferable to secure the use of a few beds for this disease at several of the well-known teaching hospitals.

The *school report* shows that 199,812 children were inspected belonging to the three age-groups of entrants, 8-year-olds, and 12-year-olds. Of these a smaller percentage needed treatment than ever before, the percentage figure being 37·9. The figure for 1921 and 1920 was over 39, for 1919 over 42, and for 1918 44. Malnutrition was greatly reduced during the artificial prosperity of the war. In 1920 there was a set-back and remedial measures, such as school feeding and unemployment allowances, came into play, allied with children's care organisations, and now it is satisfactory to learn that the number of children actually suffering from under-nourishment is lower than when war prosperity was at its height. The wonderful progress made in cleanliness is excellent news, as also the astonishing improvement in dental conditions. Children are now leaving school who came under dental inspection at the ages 6 to 8. Unhealthy conditions of the throat and nose, though still rife, show year by year a diminishing incidence, and "there is good ground for the belief that greater attention to hygiene is really diminishing the prevalence of nasal disease." There is a diminishing number of children referred for tonsils and adenoids, and this gives an opportunity for the introduction of more adequate methods than formerly. The heavier incidence of visual defects upon girls compared with boys tends to grow less, and the medical service is consistently endeavouring to lessen the bad effects of fine work. Dr. G. Chaikin has conducted an inquiry with regard to chorea and finds a tendency for cases of chorea to follow inversely the rise and fall of the barometric pressure, but has not traced a relationship between relative humidity and the incidence of chorea. The insidious onset of rheumatism is the difficulty, and stress is laid upon the necessity for attention to unhealthy throat conditions.

Dr. C. N. Atlee has investigated the *prevalence of goitre.* Of 77 goitrous children, 21 had apparently normal health, while of the remaining 56, 10 were mentally defective, 4 were congenitally deaf, 1 had congenital heart disease, 1 congenital cataract, and 3 were epileptic. Dr. Atlee is of opinion that goitre has increased latterly. Dr. A. G. Wells reports favourable results from *ionisation for ear disease.* Of 155 children treated, 108 were put right by one ionisation.

The Board of Education have made certain suggestions for the improvement of the *treatment scheme*, and important modifications have been made in the agreements between the Council and committees of treatment centres with a view to obtaining the highest available standard of work at the centres.

SCHOOL MEDICAL SERVICE.

Blackburn.

The total number of children examined was 7487, and of these 6067 came under the code groups. Forty cases of malnutrition are recorded at routine inspection and Dr. Allen Daley refers to malnutrition as the one defect where statistics of different places are not comparable owing to the personal factor influencing the examiner's judgment as to what is malnutrition and what is not. We would refer Dr. Daley to the work of the nutrition clinics in America, where a standard ratio of heights and weights is taken for different ages, and any variation above or below this is classified. In this way a standardised conception of nutrition and malnutrition is obtained, eliminating as far as possible the personal factor.

Dr. Daley, in common with the school medical officer for Cardiff, draws attention to the large number of children not physically fit at 5 years of age, and this is true for all the country. Maternity and child welfare departments are normally responsible for safeguarding the health of children up to the age of 5 years, or previous to their admission into school. It is impossible to exercise more than a casual supervision over children more than 2 years of age, and further, mothers are usually reluctant to take older children to a clinic, which they regard as primarily for babies. It appears that the next forward step in public health administration must be concentrated on this "No Man's Land" between 2 and 5 years. School clinics are open to these children very often, but they do not by any means adequately supply the crying need of careful examination, training, and observation of these little ones, and to bridge the gap between 2 and 5 in a place like Blackburn, a nursery school is evidently called for. Forty-six children were treated for speech defects. Two revision courses of three weeks were also taken; a brief summary of the results is given:—

Speak well and clearly—no stammer ..	34
Speak with occasional hesitation	4
Improved	6
No better	2

Dr. J. Robertson investigated the alleged association between left-handedness and stammering, and it was demonstrated that there was no special connexion between them.

Carlisle.

Of the 2483 children inspected in the routine age groups, nearly 25 per cent. were referred for medical treatment, and 42 per cent. were kept under observation for defects. Of the number referred for treatment 96 per cent. received it. Malnutrition cases amounted to 379, or 15 per cent., as compared with 9 per cent. the previous year; 18 per cent. were suffering from defective vision, 2 per cent. from defective hearing; tuberculosis definite and suspected 4 per cent. The decrease in the number of cases suffering from scabies and ringworm is considerable, scabies accounting for 516 cases as compared with 2360, and ringworm 476 as compared with 3384. Dr. Joseph Beard has calculated that the eradication of scabies and ringworm has increased school efficiency since 1919 to the extent of an additional daily attendance of 77 children, or 1 per cent. on the average daily attendance. One hundred and four school-children attended the tuberculosis dispensary during the year, 15 being new and 89 old cases. The school dentist's report shows 91 per cent. of the permanent teeth examined sound, 6·2 per cent. saveable, and 1·9 per cent. unsaveable, against 88 per cent., 9 per cent., and 2·9 per cent. respectively for the previous year. He regards the production of the largest percentage possible of sound permanent teeth as the main object of school dental work. He finds that the bad septic mouth is now the exception rather than the rule, and that the children's teeth are on the whole cleaner and their mouths healthier.

Cardiff.

The total number of medical examinations for 1922 was 9911 in the routine groups and 2563 special cases. Skin disease was recorded in 7·2 per cent., defective vision in 6·6, and otitis media in 2 per cent. On the whole the proportion of children showing defects of one kind or another is remarkably constant, such slight increases as have occurred being mainly due to the increased number of special cases examined. Malnutrition was found in 0·9 per cent., these figures being the same as for 1920. Dr. Ralph M. F. Picken has set out the tables of heights and weights for 1914, 1921, and 1922, to demonstrate the absence of any notable change since the beginning of the war.

The number of children found or suspected to be suffering from tuberculosis was 76. These children were all attending school at the date of examination. During the year 17 children between 5 and 15 years of age died of tuberculosis. Remaining at the end of the year were 35 children known to be suffering from or suspected of tuberculosis and excluded from school for this reason, while other 14 children of school age had never attended because of tuberculosis. Altogether the total number of cases of tuberculosis between 5 and 15 years of age whose names remained on the records at the end of the year amounted to 123, and Dr. Picken goes on to say that none of these ought to be in attendance at the ordinary school but many would be suitable for education in a special school. Out of 4087 children commencing school life, 32·3 per cent. were found to require either medical treatment or observation. The existence of such a percentage of disease or ill-health in pre-school years definitely points to the necessity for establishing a nursery school in Cardiff to follow on the child welfare centres. Of the 2775 children requiring treatment during the year, the necessary treatment was carried out in 61·3 per cent. of the cases.

Three cases of accidentally acquired syphilis are recorded, all of which cleared up rapidly after a course of novarsenobenzol injections and hydrarg. cum cret. at the V.D. clinic. The superficial resemblance which the cases bore to ringworm, impetigo, and psoriasis diverted the attention from the possibility of secondary syphilis, and it was only after a more complete examination that the true nature of the disease was established.

Leamington Spa.

The number of children examined in the three code groups was 1102, an increase of 316 over last year. Apart from uncleanliness and dental defect, 13 per cent. were found to require medical treatment. This was carried out at the hospital in 301 cases out of the 392 requiring it. Sixty per cent. of the children in attendance at school were found to be unvaccinated, and Dr. W. L. Goldie puts this state of affairs down ore to apathy on the part of the parents than to a onscientious objection to vaccination. In the case f entrants, the figures were 2 per cent. worse than those f the previous year and 8 per cent. worse than in 1920.

Eastbourne.

The total number of children examined during the ear was 1285, 28 of these being special cases. In 48 er cent. of the cases the parents attended. Malnu-ition cases were less than half the number recorded st year owing to an improvement in economic onditions in Eastbourne. Uncleanliness and skin iseases have decreased, but no fewer than 50 per cent f the children examined had defects recorded. linics are held daily at the Town Hall, and operations re performed at the hospital. Altogether 3083 hildren attended the various clinics, making 6544 ttendances. Dr. W. G. Willoughby reports that the pen-air school opened in June, 1920, has fully justified s existence. At the end of the year there were 60 hildren, boys and girls, on the books. The majority f cases are suffering from anæmia and malnutrition, ee meals being given where necessary, also hot milk the mornings. The cost to the education authority f this school for one year was just over £28, apart om salaries.

MENTAL HOSPITALS SERVICE.

ROYAL EASTERN COUNTIES INSTITUTION FOR THE MENTALLY DEFECTIVE, COLCHESTER.

The sixty-fourth annual report of this institution an attractive publication, one of its purposes being gain new subscribers to the institution. The ustrations give a happy impression of its activities. ifluential support has been given to this institu-on throughout the Eastern Counties; a large sum added annually to the funds by means of collec-ons in various towns and districts undertaken by organisation under the direction of the Duchess Grafton. Of the children, who form the main body the inmates, a great number are cared for at rates hich bear no relation to the cost of maintenance, id the expenses of the institution, as well as its rther expansion, are therefore largely dependent on ibscriptions.

The numbers accommodated have increased greatly iring the last few years, and a sixth branch home has cently been opened. An excellent site is available r a rebuilding scheme, which would not only provide lditional and better accommodation, but simplify e management and reduce the cost of upkeep at esent involved in maintaining six separate branches attered over a wide area. The output of the work-ops, which afford occupation for many of the mates, shows a notable increase, and domestic or itdoor work of some nature, however simple, is signed to everyone capable of performing it, much the benefit even of the lower grades, who may eviously have felt that they were "no good to iyone." Games of all kinds—swimming, music, and ting and other entertainments—appear to take a rge part in the life of the institution. A small oportion of the higher-grade cases leave the institu-on to take up work elsewhere, principally domestic rvice, and this system has been successful, but its tension to factory work is at present impossible ing to the prevalence of unemployment among rmal persons.

There has been an increase in the number of ileptics admitted. The medical superintendent, . F. D. Turner, does not regard their segregation om other patients as either practicable or really cessary. The results in these cases, which at present m 13 per cent. of the total population, are disap-inting. Dr. Turner says of them: "Although we ntinue to test new remedies which are frequently ought out, I am unable to report any good results." e institution has been singularly free from infectious sease, and the deaths that have occurred have been incipally among patients of the lowest grade, in om the duration of life, owing to coincident physical bleness, rarely exceeds 25 years.

Correspondence.

"Audi alteram partem."

THE TOOTH-BRUSH AS A CARRIER OF VIRULENT DIPHTHERIA BACILLI.

To the Editor of THE LANCET.

SIR,—Mr. A. T. Pitts, in his letter to THE LANCET of June 16th (p. 1238) on "The Rôle of the Tooth-Brush," drew attention to the risks attaching to the tooth-brush as a harbourer, and therefore potential spreader, of infection. In support of his statements, and directly bearing on these risks, the following note is perhaps worthy of record.

The occurrence of several cases of diphtheria at an industrial school in the Midlands led to an investigation by one of us (G. H. C.), with the object of discovering possible factors concerned in spreading the disease amongst the boys. A certain boy (E.) had previously been found with nasal excoriation which yielded, on swabbing and cultivation, abundant *B. diphtheriæ*, and he had, in consequence, been transferred to hospital. The tooth-brush used by this boy came under suspicion as a not unlikely vehicle of infection, and, to satisfy curiosity on this point, was submitted to J. G. F. for bacteriological examination.

It should be stated that the brushes belonging to the boys were each clearly marked with the owner's number, and when not required were hung separately by means of rings from a shelf in the school lavatory. "Carbolic" tooth-powder was in general use, and was supplied to the boys from a common bowl. It was stated by the superintendent of the school that, following E.'s removal to hospital, he had as a precautionary measure soaked E.'s tooth-brush (and also the brushes of other boys) for 36 hours in a 5 per cent. solution of a disinfectant of the lysol class. During the period of about ten days, which elapsed between this soaking and its removal on May 23rd for bacteriological examination, the brush in question had been hanging in its usual place in the school lavatory.

Bacteriological Examination. — The brush was received a fortnight after being last in use by E. The lower half of the bristles and their insertion into the bone holder were coated with the remains of pink tooth-powder. About a score of bristles were detached and cultivated on the surface of plated blood-serum. After 24–48 hours' incubation it was possible to select from the mixed growth investing the various bristles a certain number of the most likely looking colonies. These were picked off and transferred to sloped serum tubes and incubated at 37° C. The sub-cultures resulting consisted of various cocci and bacilli, and included in the latter group were certain diphtheroids and what appeared to be morphological *B. diphtheriæ*. On further sub-culture the latter were definitely isolated and identified microscopically, and were also found to ferment glucose, but not saccharose. Confirmatory evidence as to the true character of the isolated organism could only be supplied by animal test. For this very necessary means of proof we are much indebted to the kindness of Drs. W. M. Scott and A. J. Eagleton, to whom separate sub-cultures were sent. Their independent results by animal-inoculation tests showed the organism to be indisputable virulent *B. diphtheriæ*.

There is, therefore, no doubt that a tooth-brush may, as Mr. Pitts stated, "harbour infection," and, although not proven in the instance here recorded, it is highly conceivable that by mixed brush contact, or if "used promiscuously" by others than its owner, the tooth-brush may lead to the dissemination of infection from an active diphtheria "carrier." The use by the boys in common of the tooth-powder bowl suggests a further possible means of spread. It would also appear that the practical disinfection of tooth-brushes, whether by the particular powder in favour or by immersion in reputed "disinfectant" solution, may be by no means as reliable or effective as is commonly believed.

Lysol Disinfection of Artificially Infected Tooth-Brushes.—To test this point under conditions as nearly approaching the real as possible, three used tooth-brushes were dipped in 5 c.cm. peptone emulsion of a 24 hours' serum slope culture of the *B. diphtheriæ* derived from E.'s brush. The brushes were then allowed to dry in the incubator in covered Petri dishes and were afterwards soaked in solutions of the same brand of lysol as that used at the school, which in 2 per cent. strength purports to kill *B. diphtheriæ* in one minute. The strengths of the lysol used for the tests were 1, 2, and 5 per cent. dilutions, in each of which the separate brushes remained for periods of 1, 5, 15, and 30 minutes, and finally 24 hours.

At the conclusion of each of the periods, and after a brief rinsing in sterile water to remove excess of lysol, bristles were extracted with every possible precaution against contamination, allowed to dry for a few minutes in sterile Petri dishes, and then transferred to the surface of plated serum for 24 hours' incubation at 37° C. Previous to the lysol immersion a few bristles were removed from each artificially infected brush for control cultivation.

The final results of a series of repeated tests were as follows: 1. *B. diphtheriæ* were isolated from each of the three controls, which were also heavily but not equally infected with various cocci, sarcinæ, and unidentified bacilli. 2. Using freshly prepared lysol solutions, *B. diphtheriæ* were successfully isolated in two series of tests from bristles of brushes which had been exposed for 1 and 5 minutes to a 2 per cent. solution, and for 1 minute to a 5 per cent. solution of lysol. A suspicious bacillus was also isolated from 5 per cent. lysol after 5 minutes' exposure, but proved to be a diphtheroid, resembling *B. xerosis*. 3. Using lysol solutions, which had been standing for at least two days, *B. diphtheriæ* were obtained from bristles after exposure to a 5 per cent. solution for as long as 15 minutes.

A culture of the *B. diphtheriæ* which had been isolated from bristles exposed to 2 per cent. lysol for 5 minutes was submitted to Dr. Scott, who again very kindly applied a guinea-pig test, and has reported the strain to be "still virulent." We are also much indebted to Dr. C. C. Okell, who found the diphtheroid, already mentioned, to be avirulent; but the *B. diphtheriæ*, surviving 5 per cent. stale lysol for 15 minutes, was virulent. Such results were to be expected, as the parent culture from E.'s tooth-brush had also proved virulent, and no change in virulence was likely to occur as the result of the surviving organism's exposure to the disinfectant.

Whilst accepting with some reserve the accuracy of the 5 per cent. strength of the lysol solution, in which E.'s tooth-brush was reported to have been soaked for 36 hours, it is not improbable that the diphtheria bacilli were in some measure protected from the action of the lysol by accumulations of oral mucus and tooth-powder adherent to the bed of the brush.

Under the conditions of the imposed tests with the various lysol solutions, no such protection was afforded to the organism on the artificially infected bristles and presumably the bacillus would be more readily killed, although it proved capable of withstanding the action of a 5 per cent. lysol solution for at least 15 minutes. Mention should be made of the omission to note a point of some importance which was overlooked in the quite unexpected discovery of *B. diphtheriæ*—namely, whether the original diphtheria colonies from E.'s brush were derived from the embedded, and therefore protected, root or from the free end of the bristles.

Subsequent attempts at some weeks' interval were made to obtain this information by planting a further series of bristles from E.'s brush on to plated serum; but the results proved inconclusive, in that the chance successful finding of *B. diphtheriæ* was not repeated; however, the embedded loops of the bristles clearly showed, from the more abundant growth, that they were more heavily contaminated than the free ends.

In view of Mr. T. H. Marshall's letter in THE LANCET also of June 16th, urging the need of "A Standard fo Lysol," it was obviously important to know th composition of the particular brand of lysol used in th above tests. For this information we are muc indebted to Mr. E. T. Shelbourn, F.I.C., whos analysis was as follows: Water, 12·5 per cent. phenolic bodies distilling between 196° and 208° C. 46·2 per cent.; soap, &c., 41·3 per cent.—i.e., ver similar to the original lysol, containing approximatel 50 per cent. cresylic acid.

The tests undertaken with lysol in the thre dilutions are not claimed to be sufficiently comprehensive as to yield a conclusive index of thi disinfectant's bactericidal power. They were applie primarily to ascertain what dilution and length o exposure were necessary to inhibit or destro *B. diphtheriæ* on artificially infected tooth-brushes Under such artificial conditions it would appear tha immersion for one minute in a 5 per cent. solution or for five minutes in a 2 per cent. freshly prepare solution of standard lysol is insufficient to kill th organism.

From the diminished bactericidal power of lyso shown by results in the third series of tests, th importance of the solutions being freshly prepare appears evident. The tooth-brushes employed differe considerably as regards their original state of bacteria pollution and their mode of construction, whic allowed of retention of impurity to a varying degree For these reasons it proved difficult to assess th strength and duration of lysol treatment required fo sterilising any individual brush. Whereas, for on less heavily infected, immersion for half an hour i 2 per cent. solution sufficed to sterilise the majority o bristles; in the case of another brush, after 24 hours in a 1 per cent. solution, the growth of cocci and spore-forming bacilli still obtained, was sufficient to mask the isolation of *B. diphtheriæ*; whilst bristles from a third brush required half an hour's exposure to a 5 per cent. solution before effectual sterilisation was reached. In the case of solutions not freshly prepared 24 hours' exposure in 2 per cent. solution was insufficient to sterilise, but 5 per cent. solution for half an hour was effective for the majority of bristles.

If, as stated, E.'s tooth-brush was soaked in 5 per cent. lysol for 36 hours, the strain of *B. diphtheria* surviving was either unusually resistant, or more probably was so protected in the deeper part of the brush as to be beyond the reach of the disinfectant. Such a brush infected by a diphtheria carrier may well require longer than half an hour in 5 per cent. solution lysol for its disinfection, and the safest course is obviously to destroy it. The fact that the tooth-brush is but one of many likely vehicles of infection from a diphtheria carrier opens up a wide field for survey—particularly in residential schools—in dealing with an outbreak of diphtheria.

Among the articles to be considered are pencils and penholders,[1] spoons and forks, common drinking cups at playground fountains, school call whistles, the mouthpieces of bugles or band instruments, and—amongst boys—the cigarette not uncommonly passed from mouth to mouth. Surgeon-Commander S. F. Dudley,[1] in drawing attention to the penholder as a possible source of spread of diphtheria infection, states: "Nearly all children bite the ends of their pens, and, as this is so, a penholder must be looked on as an even more personal article than a tooth-brush. The latter is in the mouth for shorter periods than the pen, and in addition is generally soaked with a solution of some antiseptic dentrifice."

The case here recorded, however, shows that the risk of infection attaching to the tooth-brush, despite implied antiseptic protection, may be no less than that of the penholder.

The survival of organisms on tooth-brushes exposed to lysol offers a tempting analogy to the behaviour of soil bacteria in the presence of phenol, cresylic acid, and naphthalene, suggesting that some of the varied flora the mouth may have similar powers, not only of istance to "disinfectant" action, but, as has recently n shown by experiments, with bacteria of the at Rothamsted,[2] of actual growth by splitting up antiseptic and so causing its disappearance.

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[1] Medical Research Council, Special Report Series, No. 75, pp. 46 and 47. A Study in Epidemiology, by S. F. Dudley.

We are, Sir, yours faithfully,

G. H. Culverwell, M.D., D.P.H. Dub.
J. Graham Forbes, M.D. Camb.,
F.R.C.P., D.P.H.
ondon, July 31st, 1922.

ROYAL MEDICAL BENEVOLENT FUND.

To the Editor of The Lancet.

ir,—It is reported that Dr. G. E. Haslip, treasurer the British Medical Association, speaking at the ent annual meeting of the lack of support of the yal Medical Benevolent Fund, stated that "the ds are conducted in much the same way as they e 30 years ago; no new ideas are ever introduced, there is absolutely no progress."

his may be correct with respect to the administion of the Fund, probably necessarily so having ard to the limited sums at the disposal of the mmittee, but I venture to think that a new idea of rogressive nature was introduced when the medical ctitioners on the panel in Leicester consented nimously to subscribe annually towards medical allied charities a farthing for each State-insured son on their lists. This yields over £100 per annum, £50 have been given to the Royal Medical Beneent Fund for each of the last two years, and in probability a similar sum will be sent this year. remainder of the amount raised is distributed lly to medical and allied charities.

would suggest that steps be taken to urge every te insurance area in the country to follow this mple. If this were effected, the "disgrace to the fession" would be quickly removed as the sum ruing on, say, 10 million insured persons, would be vards of £10,400 per annum. This would enable the mittee to deal with a more generous hand, and the ma of "miserable doles" would be a thing of the t. I am, Sir, yours faithfully,

Astley V. Clarke,
Treasurer, Leicester Sub-Division of Union of Medical Practitioners.
icester, July 27th, 1923.

OPHTHALMOLOGICAL TRAINING FOR MEDICAL STUDENTS.

To the Editor of The Lancet.

ir,—If ophthalmology is to be made a subject for qualifying examination, in my opinion it would be isable for ophthalmologists to set out what they rd as essential for the medical student to know. clearly ophthalmology as a whole must be a postluate study. With the idea of arriving at some nite conclusion on this point, I suggested to the ncil of the Ophthalmological Section of the Royal ety of Medicine a year or two ago that I should a discussion on the teaching of ophthalmology to ical students.

o take one point, which might be usefully discussed amely, the use of the ophthalmoscope—it is quite ible for the student to learn how to handle the rument, and to see the disc, and perhaps draw t he sees. But it is impossible with the short time is disposal to acquire any useful knowledge by ns of the instrument, in the sense of being able to gnise early papillitis, slight optic atrophy, or itis. And apart from the ability to do that, I h doubt if the ophthalmoscope be of any use in ral practice.

have always grudged the relatively large propor- of time spent by students in the dark room On the one hand they were not learning anything practically useful, and on the other hand they were missing opportunities of examining cases of external diseases. conjunctivitis, iritis, and the like, cases which are of frequent occurrence in general practice, and the recognition of which is so important. And the same criticism applies, I think, to time spent in learning to estimate—as distinct from learning to recognise—errors of refraction.

I am, Sir, yours faithfully,

Harley-street, W., July 31st, 1923. Percy Flemming.

THE TREATMENT OF HABITUAL CONSTIPATION.

To the Editor of The Lancet.

Sir,—I was greatly interested in Dr. A. F. Hurst's article on the Treatment of Habitual Constipation.

I have seen some of the most serious cases of habitual constipation *cured* by the persistent use of the liquid extract of cascara, but as a rule it takes 6 to 12 months to effect a cure. At first 20 to 30 drops ought to be taken three times a day in water after meals. After a few weeks the dose can be very gradually lessened, until at the end of five or six months it is reduced to three or four drops, or even to one drop three times a day. This treatment teaches the bowels to get into the daily habit of evacuation. The difficulty is to get patients to persevere over so long a period until a cure is effected.

Habitual constipation has been treated "by suggestion." The method is certainly worth trying in some of the most serious cases. I may note a remarkable case which came under my notice. The patient, an American lady, consulted a well-known authority on hypnotism, who, after a short consultation, told her that her case was very simple, and that she would have a daily evacuation of the bowel every morning at 10 o'clock. Some time after she appeared again with the report that she was perfectly cured, but requested that the physician would make the time 9 o'clock as the earlier hour would be more convenient.

I am, Sir, yours faithfully,

Samuel R. Collier, M.D.
Wimbledon, July 24th, 1923.

THE MEDICAL DIRECTORY, 1924.

To the Editor of The Lancet.

Sir,—The annual circular has been posted to every member of the medical profession and most of the returns have already been received. If any practitioner has not yet sent us the latest information, we shall be glad to receive it by an early post.

We are, Sir, yours faithfully,

The Editors.
7, Great Marlborough-street, London, W. 1,
July 30th, 1923.

Liverpool Royal Infirmary: New Nurses' Home.—The Duke and Duchess of York paid a visit to the city on July 24th, principally for the purpose of laying the corner stone of the new building. The first portion is estimated to cost between £40,000 and £50,000, of which all but about £5000 have already been collected. The proceedings included the presentation of a Carnegie Hero Trust bronze medallion to Mr. C. R. Woods, who has been X ray operator to the infirmary since 1903, and who is now incapacitated by X ray dermatitis from further service.

People's League of Health.—The travelling scholarship prize award in connexion with the Sims Woodhead series of Constructive Educational Health Lectures recently given by the League at the headquarters of the National Union of Teachers, Mabledon-place, London, W.C., has been made to Miss Alice Gloyn. Miss Gloyn, who since 1917 has been in charge of the Camberwell Day Sanatorium, working under the London County Council in conjunction with the tuberculosis officer for Camberwell, has chosen to attend Dr. A. Rollier's course of lectures on heliotherapy at Leysin in Switzerland, from August 13th to 19th. Miss Gloyn will also visit the Grancher and other institutions in France dealing with tuberculosis in children.

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he Bacteria of the Soil and the Utilisation of Organic eptics. By P. H. H. Gray, M.A. (Rothamsted). "Dis- y," June, 1923, p. 153.

Medical News.

Royal College of Physicians of London.—An ordinary Comitia of the College was held on July 26th, Sir Humphry Rolleston being in the chair.

The following candidates, having passed the required examinations, were admitted as Members :—

Drs. F. Braid, R. A. Chambers, E. F. Creed, S. W. Davidson, S. C. Dyke, H. S. Le Marquand, G. R. McRobert, O. Marriott, W. Moodie, W. J. Morrish, E. O'Flynn, A. Patrick, G. M. J. Slot, G. H. Sowry, W. B. B. Taylor, G. D. Whyte, and W. B. Wood.

Licences to practise physics were granted to 193 candidates. Diplomas were granted, jointly with the Royal College of Surgeons, in Public Health to 19 candidates, in Tropical Medicine and Hygiene to 16 candidates, in Psychological Medicine to 8 candidates, and in Ophthalmic Medicine and Surgery to 11 candidates.

The following College Officers, Members of Committees, and Examiners for the ensuing year were elected on the nomination of the President, Council, and Library Committee :—

Censors.—Dr. John Fawcett, Dr. H. Morley Fletcher, Lord Dawson of Penn, and Dr. E. Farquhar Buzzard.
Emeritus Treasurer.—Sir Dyce Duckworth.
Treasurer.—Dr. Sidney P. Phillips.
Registrar.—Dr. Joseph A. Ormerod.
Harveian Librarian.—Dr. T. H. Arnold Chaplin.
Library Committee.—Dr. Herbert Spencer, Dr. W. Cecil Bosanquet, Dr. George F. Still, Dr. Charles J. Singer.
Curators of the Museum.—Dr. J. Mitchell Bruce, Sir Seymour John Sharkey, Sir Frederick W. Andrewes, Dr. William Hunter.
Finance Committee.—Dr. Arthur T. Davies, Dr. Raymond H. P. Crawfurd, Dr. Frederick J. Poynton.
Examiners.—Chemistry : Dr. William B. Tuck and Mr. Charles S. Gibson. Physics : Dr. Frederick Womack and Dr. William E. Curtis. Practical Pharmacy : Dr. Alfred E. Russell, Dr. Edward A. Cockayne, Dr. Philip Hamill, Dr. Alfred J. Clark, Dr. Walter E. Dixon. Physiology : Dr. John B. Leathes and Dr. John Mellanby. Anatomy : Dr. Thomas B. Johnston. Medical Anatomy and Principles and Practice of Medicine : Sir Archibald E. Garrod, Dr. John H. Drysdale, Dr. Arthur P. Beddard, Dr. William C. Bosanquet, Dr. James W. Russell, Dr. Charles R. Box, Sir James Purves-Stewart, Dr. Charles Bolton, Dr. Lewis Albert Smith, Sir William H. Willcox. Midwifery and Diseases Peculiar to Women : Dr. John P. Hedley, Sir Ewen John Maclean, Dr. Thomas G. Stevens, Dr. John D. Barris, Dr. Henry J. F. Simson.
Public Health.—Part I., Dr. Henry W. Hake ; Part II., Dr. David Samuel Davies.
Tropical Medicine.—Sir Percy W. Bassett-Smith (Bacteriology) ; Sir Leonard Rogers (Diseases and Hygiene of the Tropics).
Ophthalmic Medicine and Surgery.—Dr. Gordon M. Holmes.
Psychological Medicine.—Part I., Dr. Henry Devine ; Part II., Dr. James Taylor and Dr. Charles H. Bond.
Murchison Memorial Scholarship (1924).—Dr. Robert Hutchison and Dr. E. Farquhar Buzzard.

The following communications were received :—(1) From Sir Thomas Barlow, a former president, to the Emeritus Treasurer, Sir Dyce Duckworth, offering a gift of £1000 to the general funds of the Royal College, with a view to special assistance in the probable alterations to the College buildings. The offer was accepted and a most sincere vote of thanks was voted to Sir Thomas Barlow for his generous gift.—(2) From Dr. R. W. Innes Smith offering a portrait of Sir Charles Searburgh for the acceptance of the College. The Harveian Librarian, Dr. Arnold Chaplin, pointed out that this was one of the two known portraits of this celebrated physician. The offer was gratefully accepted and the thanks of the College were accorded to Dr. Innes Smith.—(3) An invitation to the centenary of the foundation of the Edinburgh Veterinary College was received and it was left to the President to nominate a representative.

The Baly Medal was awarded, on the nomination of the Council, to Mr. J. Barcroft, F.R.S.—The President announced his award of the Bisset Hawkins Medal to Dr. T. M. Legge.—The death of the Bedell, Mr. William Fleming, was reported to the College, and in connexion therewith the following resolutions were passed :—

1. That the College desires to place on record its deep regret at the death of Mr. William Fleming, and its high appreciation of his faithful and valuable services, which extended over 50 years, during 30 years of which he held the office of Bedell to the entire satisfaction of the Fellows and of all those with whom he was brought into contact.
2. That it be referred to a committee to report on all the regulations and questions connected with the duties, residence, and remuneration of the Bedell, and of any other official who may be required to carry on the administrative work of the College.

A committee was appointed to consider and report on the question of increasing the accommodation of the College, and on the best way of doing so, should it prove desirable.—An application from Dr. Philip H. Wells for the restorati
of the membership resigned by him in January, 1922, w
granted.—A report from the representative of the College
the General Medical Council concerning the last session of t
Council, and a report from the representative of the Colle
on the Managing Committee of the Chelsea Physic Gard
were received and entered on the minutes of July 16th.—
A report from the Committee of Management, dated May 9
and July 16th, was received and adopted.—After so
formal College business, the President declared the Comit
closed.

Royal Colleges of Physicians of London a
Surgeons of England.—At a meeting of the Comitia of t
Royal College of Physicians on July 26th, and of the Coun
of the Royal College of Surgeons on July 31st, diplomas
L.R.C.P. and M.R.C.S. were conferred upon the followi
193 candidates (including 34 women) who have passed t
requisite examination of the Conjoint Board and ha
complied with the by-laws :—

Patrick M. Acheson, King's Coll. ; Noel F. Adeney, Cambri
and St. Mary's ; Katharine M. Andrew, King's Coll
William A. Atkins, Birmingham ; George F. Axon, Chari
Cross ; Shriharsh Chintaman Bakhle, Guy's ; William
Barnie-Adshead, Birmingham ; Alfred A. Battson, S
Thomas's ; Arthur Beauchamp, Birmingham ; Susanna
Bernard, Royal Free ; Douglas H. Berry, Guy's ; Jo
Bevan-Jones, Univ. Coll. ; Thomas S. Blacklidge, Guy's
Nina O. Bohtlingk, Lausanne and Charing Cross ; Edwa
R. Boland, Guy's ; William B. Boone, Oxford and London
Jogesh Chandra Bose, Baltimore and Birmingham ; John
Brew, Middlesex ; Enid A. Brock, Liverpool ; Ral
Brooke, Guy's ; Samuel N. Browne, Birmingham ; Willia
A. Caldwell, Guy's ; Ralph H. Carter, McGill and Londo
Edward H. P. Cave, King's Coll. ; Norman E. Chadwic
Cambridge and St. Bart.'s ; John H. K. Clarke and Leslie
Clarke, Birmingham ; John E. Clegg, Manchester ; Eric C.
Clouston, London ; Leon Collins, Leeds ; George G. Cook
Birmingham ; Norman B. Cooke and Victor Cotton-Cornwa
Liverpool ; Richard S. Creed, Oxford and St. Thomas's
Cecily D. Crosskey, Royal Free and Birmingham ; John
Currie and Gerald C. W. Curson, Guy's ; William Dabb
Birmingham ; Cedric K. David, Univ. Coll. ; Alfred
Davies, Birmingham ; Kenneth S. Dickinson, Durham
Michele A. Distaso, Bristol and Cardiff ; Gerrit A. Dolma
Cambridge and King's Coll. ; Helen M. Du Buisson, King
Coll. ; Geoffrey Dudley, Birmingham ; Alexander
Dyson, Oxford and St. Thomas's ; Francis Earlan
Liverpool ; Harold C. Edwards, King's Coll. ; Arthur J.
Eland, St. Bart.'s ; Harry N. K. Elphick, Oxford an
King's Coll. ; Robert H. Enoch, Cardiff and St. Bart.'s
Ursula E. Eva, St. Mary's ; George M. Evans, St. Thomas's
Herman Evans, Cape and Guy's ; John L. Faull, Guy's
Alec E. Fergusson, St. Thomas's ; Mary D. Fletche
Univ. Coll. ; Kingsley Fletcher-Barrett, Cambridge and S
George's ; Mary E. Fox, Royal Free and St. Mary's
Emily L. Franklin, King's Coll. ; Noel G. C. Gane, Cape an
Middlesex ; Claudius E. Gautier-Smith, Cambridge an
St. Thomas's ; George F. Gibberd, Guy's ; Albert
Gladish, Univ. Coll. ; Neville M. Goodman, Cambridge an
London ; Roy Goodman, Charing Cross ; Arthur Gordo
Cape and Guy's ; Brian W. B. Gordon, St. Mary's ; Willia
A. Gornall, Bristol ; Arthur W. Gott, Leeds ; Sydney
Grant, London ; Ernest H. Griffin, Cambridge and Guy's
Geoffrey E. R. Hamilton, King's Coll. ; Alfred G. Hammon
Middlesex ; Tatiana I. Hardy, Moscow and Royal Free
Albert J. Hawe, Liverpool ; Montague Hawke, Guy's
Bernard D. Hendy, Cambridge and London ; Gladys Hil
Royal Free ; Nancy W. Holloway, Univ. Coll. ; Ma
Honigsberger, Cape and Guy's ; Mary D. Horton, Birmin
ham ; Phyllis M. Horton, Royal Free and Manchester
Leslie G. Housden, Guy's ; Edward R. Hughes, Liverpo
and London ; John T. Ingram, London ; William O.
Jarratt, St. Thomas's ; Santo W. Jeger, London and S
Mary's ; James Jemson, Guy's ; Bertram H. Jone
St. Thomas's ; Norman A. Jory, St. Bart.'s ; Winifred
Kane and Hilda M. Kennedy, Univ. Coll. ; Maurice E.
Killard-Leavey, Guy's ; Geoffrey L. S. Kohnstam an
Dushan Kostitch, King's Coll. ; Emilia B. M. Kraus
London ; Kenneth H. Lachlan, Westminster ; Ronald
Lane, Guy's ; Thomas Latham, Manchester ; Harol
V. R. T. Lauder, St. Bart.'s ; Bernard J. Leggett, London
Meyer M. Lewin, St. Thomas's ; John L. Lewthwait
Liverpool ; Carlos E. M. J. Libert, King's Coll. ; Lewis
Lindsay, London ; Philip M. Lissack, Cape and St. Thomas's
William A. Lister, London ; Basil S. Llewelyn, Cardiff an
Westminster ; James I. Lyons, Westminster ; Cyril
Mahoney, Madras and St. Mary's ; Leslie P. Marshal
Cambridge and London ; Charles A. Martin, London
Dorothy E. Mason, Royal Free and St. Mary's ; Hugh
Matthews, Cambridge and St. George's ; Margareth
Mautner, St. Mary's ; James Maxwell, St. Bart.'s ; Margar
S. Mills, Royal Free ; Elspeth B. Moffat, Cape and Roy
Free ; William B. R. Monteith, Cambridge and Univ. Coll.
John W. Morledge, Western Reserve ; Alfred C. Mowl
Cambridge and St. Thomas's ; John D. R. Murra
Cambridge and Middlesex ; Louis Mushin, London
Albert Nathan and Maurice Newfield, Charing Cross
Edgar Obermer, Lausanne and St. Bart.'s ; Herbert
Oldershaw, St. Bart.'s ; Carrie H. Osmond, Bristol
Chatbupuzhankaren Lonappen Ousep, Madras and Edin
burgh ; Emrys D. Owen, Cardiff ; Julian N. J. Pachec
Madras and London ; Louise O. Paterson, Royal Free
Reginald T. Payne, St. Bart.'s ; John Pearce, Westminster

Florence M. Pearson, Royal Free and St. Mary's ; Gerard G. Penman, Cambridge and St. Thomas's ; Richard P. Perera, Ceylon and London ; Alan C. T. Perkins, King's Coll. ; Leslie P. Phillips, Charing Cross ; Jeffrey W. Poole, St. Bart.'s ; Thomas H. I. Potts, Sheffield and St. Mary's ; Abraham T. W. Powell, Guy's ; Chernagiri Krishnaswami Rau, Madras and Middlesex ; Leslie Reuvid, Univ. Coll. ; Esther M. E. E. Rickard, Royal Free ; Ronald Riley, Cambridge and St. Mary's ; John Roberts, Liverpool ; Morris Robinson, Univ. Coll. ; Thomas E. Ryves, Oxford and St. Bart.'s ; Lewis H. Savin, King's Coll. ; James M. Schofield, St. Mary's ; Harry Seelenfreund, Guy's ; Wilfrid P. H. Sheldon, King's Coll. ; Ronald W. Smith and Arthur J. Smyth, Cambridge and St. George's ; Francis A. R. Stammers, Birmingham ; Doris M. Stone, Royal Free ; Robert V. Storer, Adelaide and St. Bart.'s ; George R. M. Swan, St. Thomas's ; Ronald G. Tame and Harry C. C. Taylor, Guy's ; Hugh A. Thomas, Liverpool ; Thomas B. Thomas, St. Bart.'s ; Guy L. Thompson, Cambridge and London ; John H. Thompson, Univ. Coll. ; George K. Thornton, Cambridge and St. George's ; Percy Thwaites, St. Bart.'s ; Doris Todd, Royal Free and St. Mary's ; Norman C. Tughan, Univ. Coll. ; Frank S. Vaughan, Birmingham and London ; Arnold L. Walker, Cambridge and Middlesex ; Edward G. L. Walker, St. Thomas's ; Hygeia L. J. Wallace, Royal Free and Charing Cross ; M. H. Webb-Peploe, Cambridge and St. Thomas's ; Ethel Whitby, King's Coll. ; Norman L. White, Cambridge and Univ. Coll. ; Joan F. Whitelock, Univ. Coll. ; Alan K. Wiggins, Middlesex ; Ernest G. Wilkinson, Birmingham ; Hubert C. M. Williams, St. Bart.'s ; Ronald E. Wilson, Cambridge and London ; Robert K. Wilson, London ; Ioos E. Wolf, Zurich ; Edith V. Wood, London ; Eric Wornum, Guy's ; James T. Wybourn, St. Mary's ; Harry D. Wyse, Guy's ; Mildred M. E. Yate, Royal Free ; Bhaskar Balvantrao Yodh, Bombay and London ; Joyce P. Yeoman, Royal Free and St. Mary's ; Bishai Zeitoun, Assiut and King's Coll. ; and Louis S. V. Zinober, Cape and London.

Diplomas in Tropical Medicine and Hygiene were conferred upon the following 16 candidates :—

Justin W. F. Albuquerque, Alec H. Baldwin, John Donald, Ganesh Venkatrao Gollerkeri, Arthur J. Keevill, Allan N. Kingsbury, Frank McCallum, Colin McIver, Emilio J. Pampana, Edwin Peterson, William J. E. Phillips, John L. Rebello, Anis Salama, Narinjan Singh Sethi, William H. Simmons, and Douglas J. Valentine.

Diplomas in Ophthalmic Medicine and Surgery were conferred upon the following 11 candidates :—

Monty Baranov, Thomas Butler, Richard Colley, Thomas Colley, Mahmoud A. M. El-Kattan, James G. F. Heal, Philip C. Livingstone, Brenda A. Mitchell, Zelman Schwartz, Sundar Das Sondhi, and Nand Lal Varma.

Diplomas in Public Health were conferred upon the following 19 candidates :—

Phanindra Nath Basu, William T. G. Boul, Lancelot G. Bourdillon, Frank A. J. Brodziak, Maude C. Cairney, Alan W. Carleton, Alan A. Cockayne, Katherine M. L. Gamgee, Edward Hesterlow, Neville H. Linzee, Muriel J. Lough, Donald W. McKay, Joseph L. Pawan, Sigrid L. S. Pearson, George L. Ranking, Harnath Singh, Gerald M. J. Slot, John Sullivan, and Mukund Lal Talwar.

Diplomas in Psychological Medicine were conferred upon the following 8 candidates :—

Yousif Abul-Nasr Barrada, Thomas M. Davie, Thomas L. Edwards, Mohamed Kamil El-Kholy, Frederick R. Martin, Eveleen B. G. Rivington, George W. Shore, and Peter M. Turnbull.

Society of Apothecaries of London.—At examinations held recently the following candidates passed in the subjects indicated :—

Surgery.—E. F. Johnson, St. George's Hosp. ; W. M. Jones, St. Bart.'s Hosp. ; I. Lipman, Westminster Hosp. ; W. R. H. Pooler, Cambridge and St. Mary's Hosp. ; and A. J. Vickery, St. Mary's Hosp.

Medicine.—W. B. Arnold, St. George's Hosp. ; C. M. John, Madras and Royal Free Hosp. ; E. F. Johnson, St. George's Hosp. ; I. Lipman, Westminster Hosp. ; M. S. Mahmud (Section I.), St. Mary's Hosp. ; and S. Thompson, Leeds.

Forensic Medicine.—W. E. Farnham, Birmingham ; A. Gullertein, London Hosp. ; E. F. Johnson, St. George's Hosp. ; and H. Morris, St. Bart.'s Hosp.

Midwifery.—R. Caplan, Glasgow ; J. B. Couche, Toronto University ; W. E. Farnham, Birmingham ; E. F. Johnson, St. George's Hosp. ; J. Herbert, Guy's Hosp. ; N. Howard, Liverpool ; and R. C. Pratt, Birmingham.

The Diploma of the Society was granted to the following candidates entitling them to practise medicine, surgery, and midwifery : W. E. Farnham, A. Gullertein, N. Howard, C. M. John, E. F. Johnson, and I. Lipman.

Royal College of Surgeons of Edinburgh.—At a meeting of the College held on July 25th the following candidates, having passed the requisite examinations, were admitted Fellows :—

Tajammul Ahmed, Robert C. Begg, William E. R. Coad, Arthur Denham-White, Matthew J. Gibson, Chapple Gill-Carey, Harry M. Godfrey, Alfred W. Harley, Frank Harvey, Arthur T. Hawley, Nicholas E. Kendall, John S. Lloyd, Donald M. MacLeod, Gladys H. Marchant, Leon D. Mercer.

The following were admitted Licentiates :—

Dwijendra Nath Bhaduri and Hubert Collin van Dort.

The following candidates have passed the Final Dental Examination, and have been granted the diploma of L.D.S. R.C.S. Edin. :—

William Guild, Robert C. Cook, Jacobus M. Moll, Henry F. Skinner, Thomas T. Littlefair, William F. D. Grant, Robert W. Thackwray, James B. Cowie, Ian D. J. Smith, George M. Rose, Hector G. Robb, Alexander W. Seaton, David R. Paterson, Alexander Phillips, Walter Wyatt, Douglas M. Beaton, Thomas E. Mathias, John Ross, Francis G. Reid, and William A. Welsh.

The following passed in the subjects of pathology, medicine, and surgery :—

Stuart J. Beaton, John Dewar, George M. Brigg, Bernard S. Reynolds, Agnes M. E. Wilson, Kathleen M. Scott, Frank W. Walmsley, Alexander N. Wight, Robert Lauchlan, and Lourens W. Ackermann.

The following passed in the subjects of medicine and surgery :—

James Brydone, Lesslie Macduff, Charles E. Atkinson, and Nico H. Bartmann.

Small-pox in England and Wales. — The epidemic has apparently reached its fastigium. During the week ending July 21st only 116 new cases of small-pox (with one death) were notified in England and Wales, as against 148 (with one death) in the previous week. The distribution of these 116 cases was as follows : Derbyshire 5 (Alfreton 1, Long Eaton 4) ; Gloucestershire 65 (Gloucester 57 "including 11 cases notified as chicken-pox but rediagnosed as small-pox," East Dean R.D. 6, Gloucester R.D. 1, Stroud R.D. 1) ; Lincoln 1 (Isle of Axholme R.D.) ; Notts 17 (Nottingham 1, Kirkby-in-Ashfield 4, Mansfield Woodhouse 4, Warsop 8) ; Somerset 1 (Langport R.D.) ; Wilts 4 (Swindon) ; Yorks North Riding 2 (Middlesbrough) ; Yorks West Riding 20 (Bentley-with-Arksey 9, Doncaster R.D. 11) ; Port of Plymouth 1.

The Veterinary Profession and Public Health in Ireland.—Recently a deputation from the veterinary profession of the Free State interviewed the Minister for Agriculture and urged him to reorganise the public veterinary service of the country, with a view to safeguarding the health of the public and of live stock. The deputation suggested a thorough inspection of dairy cows, cattle marts, and abattoirs so as to prevent the transmission of communicative diseases and to secure a supply of sound animal products and the better control of contagious diseases of animals, particularly those transmissible to man. They urged strongly that there should be provision made for research into obscure diseases of animals, and drew attention to the importance, from the economic point of view, of being able to give Irish cattle a clean bill of health. The Minister, in reply, expressed his appreciation of the draft scheme submitted to him, and his willingness to do all he could to put it into effect. Our Irish correspondent adds : It is encouraging to see the veterinary and medical professions moving on parallel lines in the promotion of public health.

Metropolitan Asylums Board.—A course of instruction in the diagnosis and treatment of fevers will be held twice weekly at each of the undermentioned hospitals from October to December : Eastern Hospital, Homerton-grove, Homerton, E. 9 ; North-Eastern Hospital, St. Ann's-road, Tottenham, N. 15 ; North-Western Hospital, Lawn-road, Hampstead, N.W. 3 ; Western Hospital, Seagrave-road, Fulham, S.W. 6 ; South-Western Hospital, Landor-road, Stockwell, S.W. 9 ; Grove Hospital, Tooting-grove, Tooting Graveney, S.W. 17 ; Park Hospital, Hither Green, Lewisham, S.E. 13. A two months' course will also be held in November and December at the South-Eastern Hospital, Avonley-road, Old Kent-road, S.E. 14. Students who desire to attend a course of instruction must, before attending at the hospital, bring between 11 A.M. and 4 P.M. on any week-day (except Saturday) or send by post to the Clerk to the Metropolitan Asylums Board, Victoria Embankment, E.C. 4 : (1) Authority from the Dean of the Medical School. (2) Fee, £3 3*s.* for two months' course or £4 4*s.* for three months' course ; cheques to be made payable to "The Metropolitan Asylums Board." (The student must definitely ascertain before taking out his course whether he requires a two or three months' course. In the event of his taking out a three months' course, the extra £1 1*s.* will not be refunded to him, if he finds subsequently that a two months' course only is required.) (3) Full name and address and name of medical school. (4) The names of at least two of the above hospitals, arranged in the order in which the student would prefer to attend, in case the classes at any of the hospitals should be already full. A course of lectures and demonstrations in hospital administration will be given from October to December at the North-Western Hospital. Fee for the course, £3 3*s.* ; cheques should be made payable to the "Metropolitan Asylums Board." Medical men desiring to attend are required before attending at the hospital to pay the above mentioned fee to the clerk to the Metropolitan Asylums Board, Victoria Embankment, E.C. 4, giving full name and address.

ROCKEFELLER MEDICAL FELLOWSHIPS. — The Medical Research Council announces the award of Rockefeller Medical Fellowships, tenable in the United States of America during the academic year 1923–24, to the following:—

John Crighton Bramwell, M.D. Camb., M.R.C.P., Medical Registrar and Registrar to the Cardiographic Department, Manchester Royal Infirmary.

Norman McOmish Dott, M.B., Ch.B. Edin., F.R.C.S. Edin., Assistant in the Physiological Department, University of Edinburgh.

Helen Ingleby, M.B., B.S. Lond., M.R.C.P., Assistant Physician, Victoria Hospital for Children and South London Hospital for Women.

Hugh Kingsley Ward, M.B. Sydney, D.P.H. Oxf., Member of the Scientific Staff of the Medical Research Council and working in the Department of Pathology, University of Oxford.

It is understood that further awards may be made during the coming academic year.

ASSOCIATION OF CERTIFICATED BLIND MASSEURS.—The fifth annual general meeting of this Association was held on July 19th in the Armitage Hall of the National Institute for the Blind, Great Portland-street, London, W., when Sir Robert Jones, the President of the Association, who was supported by Dr. C. Mansell Moullin, Mr. Harry Platt, and Mr. A. H. Tubby, drew the attention of the audience to the excellent report of the year's work.

IRISH HOSPITALS AND LOTTERIES.—The Committee of Dail Earann, appointed to report on the Hospital Sweepstakes Bill, reported to the Dail last week. It suggested the conditions under which it should be legal to promote lotteries on behalf of hospitals in the Free State. During the debate on the report the House was counted out. There is little prospect of the Bill going any further in the life of the present Parliament.

THE LATE DR. W. A. WALKER.—William Abraham Walker, of Southwell, Notts, who died recently at the age of 78, became M.R.C.S. in 1867, graduating M.B., C.M. Aberd. in 1868, and M.D. in 1880. At one time surgeon-major 3rd Derbyshire Regiment and a keen rider to hounds, Dr. Walker had practised little for several years; his loss will be felt by a wide circle of friends.

PUBLIC HEALTH IN SOVIET RUSSIA.—On July 21st Russia celebrated the five years' anniversary of the Commissariat of Public Health when special sessions and conferences were arranged in illustration of medical investigations and medical work in Soviet Russia. The Red Cross Society of Russia states that a special illustrated magazine will be issued under the title, "Five Years of Soviet Medicine" and pamphlets describing the work of the Commissariat in detail and the part played by Russian doctors during the five years are also to be published.

Messrs. Longmans, Green, and Co. announce that the new edition of Sir Edward Thorpe's "Dictionary of Applied Chemistry" will extend to seven volumes, of which the last volume will be largely occupied by a complete index.—Messrs. W. Heffer and Sons, Ltd. (Cambridge), announce the forthcoming publication of "The Internal Secretion of the Sex Gland," by Prof. A. Lipschütz, Professor of Physiology in the University of Dorpat, Esthonia.

LANCASHIRE COUNTY TUBERCULOSIS COMMITTEE.—The committee has offered to coöperate with the Medical Research Council by affording facilities for experiments with the Dreyer method of treatment. The Council has expressed its thanks for the offer and is considering how best to give effect to it.

MEMORIAL TO THE LATE DR. JOSHUA J. COX.—A new operating theatre in the Cottage Hospital in Buxton is to be erected by the friends and patients of the late Dr. Joshua Cox, who in 1914–17 was Principal Recruiting Medical Officer, Manchester area, and in 1917–18 Commissioner of Medical Services for the N.W. region.

THE LATE DR. F. J. KNOWLES.—The death at St. Helens on July 27th of Frederick Joseph Knowles, M.R.C.S. Eng., has removed a practitioner who was widely known outside his professional circle. Dr. Knowles was born in St. Helens, and after qualifying in 1885 at once began to practise in his native town. He was a keen Volunteer, retiring in 1910 as Lieut.-Colonel R.A.M.C., and for 30 years he was an examiner to the St. John's ambulance. He took an active interest in athletics, swimming, tennis, and cricket, and was a Freemason. His funeral, which was of a military character, was attended by almost every doctor in the district, and the streets of the town were lined by sympathetic crowds.

Parliamentary Intelligence.

HOUSE OF LORDS.

WEDNESDAY, JULY 25TH.

Therapeutic Substances Bill.

The Earl of ONSLOW in moving the second reading of the Therapeutic Substances Bill said there were certain medical preparations mainly used for the purposes of injection the strength and purity of which could be tested by analysis. The most important of these were vaccines and certain arsenical preparations and also animal extracts and insulin. The increasing use of these preparations made it necessary to establish measures for their control and regulation so that the public might be insured against danger or accident from their use, and the Bill proposed to bring these substances under control and to allow them to be manufactured in this country only under licence. The conditions of the licence were to be laid down by a Committee which would consist of the Ministers in charge of the Health Departments in this country, in Scotland, and in Northern Ireland, and they would be assisted by an advisory committee. This committee would make regulations to deal with the strength and the tests of the preparations, and they would vary the list in the schedule as scientific development dictated. The testing work would be done by the Medical Research Council so that there would be no extra expense to the Exchequer. Similar provision was made for imported substances. They would only be imported by holders of licences, and when imported they would be subject to the same tests as articles manufactured in this country. The Bill did not interfere with doctors in any way, for it did not apply to a drug prepared by a registered medical practitioner for his own patients or those of another doctor. Foreign countries for the most part had this control, or some similar form of control. The Government did not think that it ought to be possible for substances which had been rejected as not being up to the standard in the United States to be sold in this country without any penalty, as that might perhaps cause great danger to the British people.

The Bill was read a second time.

THURSDAY, JULY 26TH.

Smoke Abatement Bill.

The Earl of ONSLOW in moving the second reading of the Smoke Abatement Bill explained that it was not proposed to proceed further with the measure this session and the remaining stages would be taken in the autumn. All smoke, and not merely black smoke, was brought within the scope of the Public Health Act, 1875, and included within the term "smoke" were soot, ash, grit, and gritty particles. The fines for breaches of the law were increased, but the maximum penalty was somewhat reduced. Section 334 of the Act of 1875 was extended so as to include the processes of re-heating and annealing, hardening, forging, converting, and carbonising iron and other metals. At the end of five years any of these processes may be excluded from the section by Provisional Order. The Bill gave power to local authorities to fix their own standards for the measurement of black smoke. By Clause 3 the Minister of Health was given power to make orders extending the list of noxious or offensive gases mentioned in Section 27 of the Alkali Works Regulation Act, 1906, and the list of works mentioned in the schedule to the Act.

Viscount NOVAR, Secretary for Scotland, said he hoped to introduce a separate Bill for Scotland in the autumn.

The Bill was read a second time.

National Health Consolidation.

The Earl of ONSLOW moved the second reading of the National Health Insurance Bill, which he said was purely a consolidating Bill.

The Bill was read a second time and referred to a joint committee on consolidation Bills.

MONDAY, JULY 30TH.

Bills Advanced.

The Dentists Bill and the Therapeutic Substances Bill passed through Committee.

HOUSE OF COMMONS.

TUESDAY, JULY 24TH.

Children Employed in Mines.

Mr. DUNNICO asked the Secretary for Mines whether he was aware that boys of 14 years of age were employed in the coal-mines of this country, not only during the day but during the night also; that these boys in some areas commenced their duties between midnight and 3 o'clock in the morning; and whether he was prepared to consider the dvisability of so amending the law as to prevent the ontinuance of a system that was inimical to the physical nd mental welfare of these children.—Lieut.-Colonel LANE-ox replied: I am aware that boys of 14 may legally be mployed at night in coal-mines below ground provided that n interval of ordinarily 15 hours, and in no case less than 3 hours, separates two periods of work. I have received no epresentations that the law ought to be amended; I will ertainly give them my most careful consideration if they re made to me.

Deputy Commissioners of Medical Services.

Mr. PIELOU asked the Minister of Pensions whether he was ware that instructions had been issued to ex-Service Deputy ommissioners of Medical Services terminating their tempo-ary engagements at the end of September, and that non-ervice doctors were being retained; and whether, in view f his expressed intention of giving preference in every case o the ex-Service claims, he would arrange that preference as given to ex-Service doctors in this connexion.—Captain RAIG replied: It has been found necessary to give notice f termination of employment to 36 out of the 88 Deputy ommissioners of Medical Services employed on a six months' ontract. Of those now under notice, 30 are ex-Service and ix non-Service. There will then remain only four non-ervice Deputy Commissioners employed on a six months' ontract, and these medical officers are being retained in the terests of the pensioner in consequence of their special xperience and qualifications.

Pensioners and Tuberculosis.

Mr. MCENTEE asked the Minister of Pensions what number f men suffering from tuberculosis had applied for pensions nd had been refused a pension by his department; the umber of men so refused who had appealed against the ecision of the Ministry to the appeal tribunal; and the ercentage of such appellants who had been granted a ension.—Captain CRAIG replied: I regret that the statistics f the Ministry are not kept in a form that would enable me o answer this question in full, but I may say that during the st 15 months about 2800 claims for pension on account of uberculosis have been accepted.

WEDNESDAY, JULY 25TH.

Powers of Medical Officers of Health.

Mr. RHYS DAVIES asked the Minister of Health under hat Act of Parliament a medical officer of health had power o isolate compulsorily healthy people; and whether he ould inquire into the fact that the medical officer of health f Taunton threatened a perfectly healthy family from loucester with a period of isolation if they persisted in heir refusal to be vaccinated, and in consequence the family eturned to Gloucester, where they were examined by the mall-pox officials and given a clean bill of health.—Mr. EVILLE CHAMBERLAIN replied: I am not aware of any ct of Parliament which confers upon a medical officer of ealth power to order compulsory isolation. As regards the econd part of the question I will communicate with the ocal authority in regard to the action which the medical fficer of health is said to have taken in this case.

Health Insurance Contributions.

Major MCKENZIE WOOD asked the Minister of Health hat amounts were received in each of the years 1921 and 922 in England and Scotland, respectively, on account of ational Health Insurance contributions; and what was he shortage in each year as compared with the amounts stimated.—Mr. NEVILLE CHAMBERLAIN replied: The mounts of health insurance contributions were approxi-ately as follows: England and Wales, 1921, £22,130,000; 922, £22,500,000; Scotland, 1921, £2,740,000; 1922, 2,720,000. The shortage of contributions as compared ith the amount assumed in the financial basis of the Act—amely, about 48 contributions per insured person per annum—is estimated to be approximately 7 per cent. in England nd Wales and 10 per cent. in Scotland.

Cancer Areas.

Mr. ALFRED T. DAVIS asked the Minister of Health whether is department is collecting information with regard to what re termed the cancer areas in this country or on the Conti-ent of Europe; and what were the results, if any.—Mr. EVILLE CHAMBERLAIN replied: The subject of my hon. iend's question is receiving the attention of the committee hich is advising the Ministry on cancer problems, but there re no results which can be published at present.

Birth Control Information.

Mr. BROAD asked the Minister of Health whether his epartment would raise any objection to birth control informa-ion being given at infant welfare centres to married women ho desired it by voluntary workers attached to the centres, r otherwise to their being informed, on request, where such formation could be obtained.—Mr. NEVILLE CHAMBERLAIN plied: My view is that such information as is referred to should not be given at infant welfare centres, but that women for whom it appears to be needed on medical grounds should be referred to a private practitioner or to a hospital.

Poor-law Authorities and Small-pox.

Mr. ADAMS asked the Minister of Health whether, in view of the fact that public vaccination was controlled by the Poor-law authorities, who had no responsibility in the prevention of small-pox, he would take the necessary steps to transfer their powers in this connexion to the health authorities, who were responsible for the prevention of this disease.—Mr. NEVILLE CHAMBERLAIN replied: This suggestion is under consideration in connexion with the general question of possible amendment of the Vaccination Acts.

Use of Poor-law Hospitals.

Mr. RHYS DAVIES asked the Minister of Health whether, in view of the fact that the voluntary hospitals of the country were crowded and subject to long waiting lists and that a large number of beds were unused in the Poor-law hospitals, he could take some immediate action to remove this anomaly. —Mr. NEVILLE CHAMBERLAIN replied: I do not think I could usefully undertake any general action in the direction suggested, but I should be very glad to consider any proposals which may be put forward by boards of guardians and the authorities of the hospitals for the general use of surplus accommodation in Poor-law infirmaries.

Deaths from Starvation.

Mr. ROBERT RICHARDSON asked the Minister of Health whether he was aware that it was ascertained, by inquests, that in 1921 three persons died of starvation in the unions of Hammersmith, St. Olave, and Bermondsey, in the county of London; whether his department had taken any and, if so, what steps to prevent similar deaths; whether any and, if so, how many deaths in that county in 1922 were found by inquest to have been due to starvation or accelerated by privation; if he could supply particulars as to age, sex, date of inquest, and union concerned; whether any and, if so, what Poor-law officers were examined at the inquest; and whether any of the persons so dying in either year were tramps or homeless.—Mr. NEVILLE CHAMBERLAIN replied: I am aware that three cases of death which occurred in the County of London in 1921 were found by inquest to be due to starvation. The unions concerned were Paddington, Hammersmith, and Bermondsey. In the year 1922 no deaths in the county were found by inquest to have been due to starvation or exposure, and accordingly the third and fourth parts of the question do not arise. The death which occurred in the Hammersmith union in 1921 was that of a homeless man.

Cost of Insulin.

Viscount EDNAM asked the Minister of Health whether he was aware that diabetic sufferers were unable to obtain insulin treatment at a lower cost than 10*s.* per day, although panel patients under the Insurance Act were obtaining free treatment; and whether he would make arrangements for uninsured persons to obtain this treatment at a lower cost. —Mr. NEVILLE CHAMBERLAIN replied: I am advised that the average cost of insulin is at present about one-third of the figure stated by my noble and gallant friend, though the treatment of exceptionally severe cases such as must go to an institution may cost more. It is within the power of the guardians, on the advice of their medical officer, to pay for the supply of insulin in cases of destitution.

Viscount EDNAM: In view of the importance of this matter has not the time come for the Ministry to control the price?—Mr. CHAMBERLAIN: I do not think so, because the price has been reduced already very materially and I have good hope that it will be still further reduced.—Viscount EDNAM: It is still very high and far above the figure which an ordinary person can afford.

THURSDAY, JULY 26TH.

Ex-Service Men and Medical and Surgical Treatment.

Captain BOWYER asked the Minister of Pensions how many officers and men disabled in the great war had received medical or surgical treatment at the cost of his department. —Major TRYON replied: Approximately 1,500,000 courses of treatment have been provided by my department for the officers and men who were disabled in the great war.

Salford Public Vaccinator and the Regulations.

Mr. TILLETT asked the Minister of Health whether his attention had been called to the fact that the public vaccinator of Salford insisted on vaccinating the child of Mr. R. Headon, of 79, Nora-street, Lower Broughton, in spite of the fact that the period during which a conscientious objection to vaccination might be lodged had not expired, the child having been born on March 10th and vaccination taking place on April 19th; and what steps he proposed taking to prevent this abuse of the regulations.—Lord EUSTACE PERCY replied: My right hon. friend has communicated with the guardians in reference to this case, and I am informed that the public vaccinator called at the house of Mr. Headon on April 19th and offered to vaccinate the child; that the mother did not raise any objection or demur in any way; and that she has confirmed this statement but added that she thought vaccination was compulsory. There is no evidence that the public vaccinator insisted on vaccinating the child without the parent's consent, or of any abuse of the regulations which calls for any special action on the part of the Minister. I may add that the exemption certificate of conscientious objection is dated 25 days after the child had been vaccinated.

Cream, Milk, and Cheese Standards.

Mr. HURD asked the Minister of Health what was the present position of the movement in his department to carry out the recommendations of the departmental committee in favour of standards of quality for cream, dried milk, and cheese.—Lord E. PERCY replied: The draft regulations dealing with dried milk have now been published in accordance with the requirements of the Rules Publication Act, 1893. As regards cream and cheese I would refer my hon. friend to the answer which my right hon. friend gave on this subject on the 11th inst.

FRIDAY, JULY 27TH.

Deaths from Small-pox.

Mr. RHYS DAVIES asked the Minister of Health how many of the small-pox deaths registered during 1922 were classified as vaccinated, how many as unvaccinated, and how many as doubtful as regards vaccination; and how many of these deaths occurred in children under 5 years of age.—Mr. NEVILLE CHAMBERLAIN replied: Of the 27 deaths attributed to small-pox during 1922, 12 occurred in persons who had been vaccinated at some time in their lives. Ten among unvaccinated persons, three among those who were said to have been vaccinated but who showed no signs of vaccination, and two among those previously unvaccinated who were vaccinated during the incubation period of small-pox. There were four deaths among children under 5 years of age; of these three were unvaccinated, and one was vaccinated during the incubation period of small-pox, but had not previously been vaccinated.

MONDAY, JULY 30TH.

Medical Services for Kenya Natives.

In reply to Mr. MOREL, who asked the Under-Secretary for the Colonies whether, in view of the recent declaration of H.M. Government that the administration of the Colony of Kenya should be based upon the principle of trusteeship for the native population, he would take steps to secure that the principle be adopted that at least one-fifth of the direct taxes paid by the natives should be returned to them in technical education, medical service, and agricultural instruction.—Mr. ORMSBY-GORE replied: I should be glad if, consistently with the general financial position of the Colony, a larger proportion of revenue could be devoted to services for the direct benefit of the native. The matter will not be lost sight of, but I do not think that any fixed percentage can be laid down.

Conscientious Objection to Vaccination.

Mr. TREVELYAN THOMSON asked the Minister of Health whether, in view of the issue of Circular No. 424, dated July 23rd, to boards of guardians, a statutory declaration of conscientious objection to vaccination in the form set out in the Schedule to the Vaccination Act, 1907, would be accepted by vaccination officers in place of the new form to be issued by the Ministry.—Mr. NEVILLE CHAMBERLAIN replied: The form of statutory declaration of conscientious objection to vaccination which will be issued by my department to vaccination officers will be the form set out in the Schedule to the Vaccination Act, 1907. The Act provides that these statutory declarations must be made in that form or in a form to the like effect.

Mr. LANSBURY asked the Minister of Health whether he would explain why he had issued an order requiring a person making a statutory declaration of conscientious objection to vaccination to make such declaration only on a form supplied by the vaccination officer, in view of the provision in the Vaccination Act, 1907, Section 3, permitting the use of the form set out in the Schedule to the Act or a form to the like effect.—Mr. NEVILLE CHAMBERLAIN: The hon. Member appears to be under some misapprehension. The Vaccination Order recently issued states that these declarations must be made in a form which may be obtained from the vaccination officer or in a form to the like effect. The form issued to vaccination officers will be the form set out in the Schedule to the Vaccination Act, 1907.

Mr. EDWARDS asked the Minister of Health whether he had decided to alter the system of obtaining forms under which exemption from vaccination can be obtained and which has been in force for 15 years; and whether, in view of Section 3 of the Vaccination Act of 1907, he would state his authority for making such order.—Mr. NEVILLE CHAMBERLAIN: The answer to the first part of the question is in the affirmative. As regards the second part, the authority for the Vaccination Order recently made is contained in Section 15 of the Vaccination Act, 1871, and I find nothing in the Act of 1907 which prescribes the manner in which forms for the purpose of statutory declarations under that Act are to be obtained.

Court of Appeal for Lunatics.

Mr. ROBERT RICHARDSON asked the Minister of Health if he was aware that the recent transfer of the lunacy department by Order in Council from the Home Office to his department had had the result of throwing into abeyance many matters connected with legal sanction and the liberty of the individual; and, in view of the fact that the scope of his Ministry did not extend to judicial investigation, would he consider the possibility of instituting a court of appeal for persons unjustifiably confined in asylums.—Mr. NEVILLE CHAMBERLAIN replied: The transfer of certain powers under the Lunacy Acts to the Ministry of Health by Order in Council under the Ministry of Health Act has not had the result suggested by the hon. Member; the second part of the question does not, therefore, arise.

Nurses' Registration Rules.

Dr. CHAPPLE asked the Minister of Health whether he was aware that, under section 3 (2) (*c*) of the Nurses' Registration Act, 1919, rules were to be made enabling persons who had been bona fide engaged in practice as nurses under certain conditions to be admitted to the register, providing application was made within a period of two years after the date on which a rule first came into operation, and that a rule first came into operation on July 7th, 1923; could he now say whether persons to whom this rule applied might, if otherwise qualified, be admitted to the register; and would he say whether he had satisfied himself that the General Nursing Council was correctly interpreting the Act and the new rule.—Mr. NEVILLE CHAMBERLAIN replied: The hon. Member has not quoted the Act correctly. The wording of the section in question is "the date on which the rules to be made under the provisions of this paragraph first come into operation," and I am advised that the effect of the provision is to allow a period of two years from the date when the first body of rules came into operation. This date was the 14th July, 1921, and the two years' period having now expired the General Nursing Council have no power to admit further applications for registration as existing nurses.

Medical Women and Nurses in Fiji.

Mrs. WINTRINGHAM asked the Under-Secretary of State for the Colonies whether he could state the present numbers of men, women, and children respectively in the Indian community in Fiji; whether there were any fully trained medical women, nurses, or midwives in the islands and, if so, of what nationality; and what arrangements were made by the Fiji Government for the medical treatment of the Indians.—Mr. ORMSBY-GORE replied: The census of 1921 showed 23,407 Indians under 15 years of age, 24,886 men and 12,326 women. There were two European women medical practitioners (one of whom was presumably the Government medical officer whose agreement recently expired), and women nurses numbering 33 Europeans, 7 half-castes, 31 Fijians (not including those in the native villages), and 5 Indians. No distinction between races is made by the Government medical and hospital service, which cost in 1922 £51,319, not including buildings; that is, over 11 per cent. of the revenue.

Prison Governors as Medical Officers.

Mr. HAYES asked the Secretary of State for the Home Department the number of prison governors who were authorised to act also as medical officers; and whether he proposed to make any change in this practice.—Mr. BRIDGEMAN replied: No change in the present practice is contemplated. There is only one governor holding the necessary qualifications to act as a medical officer.

TUESDAY, JULY 31ST.

Maternity Benefit.

Mr. NEIL MACLEAN asked the Under-Secretary to the Scottish Board of Health whether it was the intention of the Scottish Board of Health to publish the Report of the Joint Committee set up in 1920, and composed of representatives from the Consultative Committee on Local Health Administration and General Health Questions and the Consultative Committee on National Health Insurance (Approved Societies' Work) to consider and report on the interrelation of maternity benefit under the Insurance Act and the maternity and child welfare schemes of local authorities; and, if so, when.—Captain ELLIOT replied: It is not proposed to publish this report.

Miners' Nystagmus.

Mr. **PALING** asked the Secretary for Mines whether any atistics were yet available showing the number of cases of iners' nystagmus at pits where electric lamps were used, as mpared with pits where oil lamps were used.—Lieut.-olonel **LANE-FOX** replied: No, Sir, as I informed the hon. ember on March 13th, such statistics would be of little lue in themselves owing to the number of factors involved.

Penrhiewtyn Hospital.

Mr. **WILLIAM JENKINS** asked the Minister of Pensions if he ntemplated vacating the hospital at Penrhiewtyn, Neath; hether he was aware that there was considerable resentment the area at the idea of its being removed; would he state e number of wounded ex-Service men now at the hospital, e number attending there for treatment, and the extent of e area it covered, and, before any step was taken, would cause full inquiries to be made and give an opportunity to presentatives of the wounded to be heard.—Captain **RAIG** replied: It is proposed to vacate the hospital emises at Neath in the autumn, when a more suitable stitution at Chepstow will be available. My right hon. iend is not aware of any objection to this change; on the ntrary he has reason to believe that the ex-Service men preciate that it is to their advantage, in view of the tter facilities for treatment which the new institution ll afford. There are at present 169 in-patients and 78 it-patients at Neath Hospital.

Deaths from Cow-pox.

Mr. **BROMFIELD** asked the Minister of Health what were the es of the seven persons registered in the year 1922 as dying om cow-pox and other effects of vaccination.—Mr. **NEVILLE HAMBERLAIN** replied: The ages were as follows: One ed 21 days; two aged 4 months; one aged 5 months; e aged 6 months; one aged 18 months, and one aged years.

Appointments.

ERRY, R. B., M.D., Ch.B. Vict., D.P.H., has been appointed Medical Officer of Health for Gloucester.

OOD, J. V., L.R.C.P., M.R.C.S., House Surgeon, Tiverton Hospital.

NES, J. W., Certifying Surgeon under the Factory and Workshop Acts for Bridgend.

ODGERS, F. M., M.D. Manch., D.P.H., Medical Superintendent of the Lancashire County Mental Hospital, Prestwich.

ENHOUSE, G. B., M.B., B.Ch. Vict., House Surgeon to Ancoats Hospital, Manchester.

NDERWOOD, J., B.Sc. Lond., M.R.C.S., L.R.C.S. Lond., M.B., B.S. Lond., D.P.H., Permanent Assistant Medical Officer, and **DALBY, MARJORIE**, M.B., B.S. Lond., D.P.H., Temporary Assistant Medical Officer for Willesden.

oyal Infirmary, Sunderland: **RUSSELL, J. N.**, M.B., Ch.B., House Surgeon; **ALLICE, MARGARET**, M.B., Ch.B. Edin., Junior Resident Medical Officer, Children's Hospital in connexion with the Royal Infirmary.

urgeons under the Factory and Workshop Acts: **ROBERTSON, D. G.**, M.B., Ch.B. Edin. (Polmont); **BIRD, J. W.**, M.R.C.S., L.R.C.P. Lond. (Egham); and **MORRIS, G. E. V.**, M.R.C.S., L.R.C.P. Lond. (Wednesbury).

Vacancies.

For further information refer to the advertisement columns.

th, Royal Mineral Water Hospital.—Res. M.O. £200.

rmingham, City Hospital, Little Bromwich.—Senior Asst. M.O. £350.

rkenhead Borough Hospital.—Hon. Skin Specialist.

rmingham, Queen's Hospital.—Third P. to Out-patients. £50.

rmingham, West Heath Sanatorium, &c.—Med. Supt. £650.

lingbroke Hospital, Wandsworth Common, S.W.—H.S. £120.

istol, Cossham Memorial Hospital, Kingswood.—H.S. £120.

mbridge, Addenbrooke's Hospital.—Cas. O. and Res. Anæsth. £130.

rmarthenshire Education Committee.—Chief School M.O. £700.

ntral London Throat, Nose, and Ear Hospital, Gray's Inn-road, W.C.—Res. H.S. £75.

ester City and County.—Asst. M.O.H. £500.

oydon County Borough.—Deputy M.O.H. and School M.O. £780.

mberland County Council.—Asst. County M.O.H. £500.

ncaster Royal Infirmary and Dispensary.—Junior H.S. £150.

st African Medical Service.—M.O. £600.

stbourne Royal Eye Hospital.—Hon. S. and Hon. Anæsth.

eter, Royal Devon and Exeter Hospital.—H.P. £150.

minster, Devon Mental Hospital.—Third Asst. M.O. £300.

derated Malay States, Central Mental Hospital.—Asst. Med. Supt. £616.

eemasons Hospital and Nursing Home, 237, Fulham-road, Chelsea, S.W.—Res. M.O. £250.

verness, Northern Infirmary.—H.S. £120.

eds Public Dispensary.—Sen. Res. M.O. £200.

eds University, Dept. of Physics.—Prof. of Phys. Also Lecturer in Phys. £800 and £600 respectively.

Lewes Union.—M.O. for No. 1 District. £60. Also M.O. for Workhouse at Chailey. £100.

Lenham Sanatorium.—Med. Supt. £650.

Liverpool, Royal Southern Hospital.—Two H.P.'s. and Three H.S.'s. Each £100. Also Res. Cas. O. £150.

Manchester, Monsall Fever Hospital.—Jun. Med. Asst. £405 6*s.*

Manchester, St. Mary's Hospitals for Women and Children.—Asst. M.O. £100.

Mid-Wales Counties Mental Hospital, Talgarth, Breconshire.—Med. Supt. £800.

Rotherham Hospital.—Sen. H.S. £260.

Royal Naval Medical Service.—Surgeon Lieutenants.

St. Mark's Hospital for Cancer, Fistula, &c.—H.S. £200.

Staffordshire Education Committee.—Two Asst. School Med. Inspectors. £600.

West African Medical Service.—M.O. £660.

Weston-super-Mare Hospital.—H.S. £150.

The Chief Inspector of Factories, Home Office, London, S.W., announces the following vacant appointments: Uttoxeter, Staffs, and Crook, Durham.

Births, Marriages, and Deaths.

BIRTHS.

BESWICK.—On July 25th, at Mill Way, Mill Hill, the wife of Wilfrid Beswick, M.D., of a son.

HAMILL.—On July 24th, at St. John's Wood, N.W., the wife of Philip Hamill, M.D., D.Sc., F.R.C.P., of a daughter.

SPRIGGE.—On July 29th, at 4, Limefield-terrace, Levenshulme, Manchester, to Katriona (née Gordon-Brown), wife of Cecil Squire Sprigge—a son.

MARRIAGES.

DIBLE—ALLEN.—On July 25th, at St. Martyn's Church, Marple, Cheshire, James Henry Dible, M.B., M.R.C.P., to Marjorie Yeo, younger daughter of Mr. and Mrs. S. J. Allen, of Carlingford, Strines, Cheshire.

DEATHS.

MURRAY.—On July 28th, after an operation, Flora Murray, C.B.E., M.D., D.P.H., of Harley-street, W., and Paul End, Penn, Bucks, aged 54.

PETHYBRIDGE.—On June 27th, 1923, at 11, Whitefield-terrace, Plymouth, Walter Ley Pethybridge, B.Sc., M.D., aged 54.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith-road, W.

MONDAY, August 6th.—College closed.

TUESDAY.—10.30 A.M., Dr. Paterson: Medical Wards. 12 noon, Dr. Burrell: Chest Cases. 2 P.M., Mr. Sinclair: Surgical Out-patients.

WEDNESDAY.—10 A.M., Dr. Saunders: Medical Diseases of Children. 2 P.M., Mr. Gibb: Eye Dept. 2.30 P.M., Mr. Donald Armour: Surgical Wards.

THURSDAY.—10 A.M., Dr. Grainger Stewart: Neurological Dept. 3 P.M., Dr. Scott Pinchin: Medical Out-patients.

FRIDAY.—10 A.M., Mr. Dudley Buxton: Dental Dept. 2 P.M., Dr. Burrell: Medical Out-patients. 2 P.M., Mr. Banks-Davis: Throat, Nose and Ear Dept.

SATURDAY.—10 A.M., Dr. Saunders: Medical Diseases of Children. 10 A.M., Mr. Banks-Davis: Operations on Throat, Nose and Ear.

Daily, 10 A.M. to 6 P.M., Saturdays, 10 A.M. to 1 P.M., In-patients, Out-patients, Operations, Special Departments.

INDEX TO "THE LANCET," VOL. I., 1923.

THE Index and Title-page to Vol. I., 1923, which was completed with the issue of June 30th, is now ready. A copy will be sent gratis to subscribers on receipt of a post-card addressed to the Manager of THE LANCET, 1, Bedford-street, Strand, W.C. 2.

THE LANCET: SUBSCRIPTION RATES.

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Notes, Comments, and Abstracts.

TYPHUS FEVER EPIDEMIC AMONG THE GREEK REFUGEES.

BY SIR PATRICK HEHIR, K.C.I.E., C.B., C.M.G., M.D. BRUX., F.R.C.S., F.R.C.P. EDIN.,
MAJOR-GENERAL, I.M.S. (RET.): MEDICAL ADVISER, BRITISH RED CROSS SOCIETY IN GREECE.

(Concluded from p. 210.)

Complications.

BRONCHITIS of greater or lesser severity is present in a large proportion of cases. It usually appears early, and if persistent and implicating the bronchioles, is often fatal. Bronchopneumonia is one of the commonest complications, usually affecting the bases of both lungs. Pleurisy is much less frequent, but there are few large typhus wards in which a case may not be found. In one infectious diseases hospital two of these cases were being operated on for effusion during my visit. Diarrhœa, very common in the later stages of the disease, usually begins on the eighth or ninth day, is often difficult to check, and if severe and persistent adds much to the patient's danger. Many medical men in Greece dealing with typhus on a large scale, spoke to me of implication of the heart muscles in the disease; they considered that in most cases there was a certain amount of myocarditis. I saw one case of acute endocarditis as a complication. Cardiac dilatation is likewise often present, and in the acute form is not uncommon as a terminal event in fatal cases. Parotitis is one of the more serious complications; I saw altogether 20 of these cases, as many as three in one ward of 30 patients; in two the swelling was so great and universal in the face and neck that the features were obliterated. In one hospital with 156 cases, there were only three of parotitis, and in another with 86 cases there was none. In the latter, during the early months of the epidemic, there had been altogether 12 cases. Otitis media occurs in a small percentage of cases; it may become chronic. We have seen a few of these distressing middle-ear infections among our refugees who return from the infectious diseases hospitals with a chronic suppurative discharge from one or both ears, the hearing being always defective; when both ears are involved, there is little hearing left. Actual deafness is a marked feature of many cases of typhus during the later stage of the disease; this is quite distinct from the dullness of intellect that exists at this stage. One or more cases of conjunctivitis and keratitis are often met with in typhus hospitals. Using a disinfectant eye-wash every four hours from the time of admission in one hospital stopped this form of complication altogether. Gangrene implicating the toes occasionally occurs; I saw two such cases where amputation was carried out; they recovered. Bedsores are common, especially when nursing is not of a high order.

Mortality.

There seems to be a remarkable difference in the intensity and mortality of typhus in different areas. The average mortality in the infectious diseases hospitals near Athens is roughly 10 per cent.; it is, however, much higher in some towns, such as Corfu, Patras, Volo, &c. It varies greatly at different ages, being very high (50 per cent. in some towns) in refugees of 50 years and over. The high death-rate in the old may be associated with the economic conditions of their life as refugees; I was inclined to believe that with the best nursing and care a fair proportion of these old people would recover. This belief is borne out by the experience of the Salonica Hospital. Among the 32 convalescents I saw in it on May 14th, there were one man of 65, one of 62, one of 57, two of 55, one woman of 61, one of 58, and two of 56. It seems to be largely a question of getting these old people under good nursing and treatment at an early stage of the disease. The mortality is very slight in children; their attacks are comparatively mild. I have been impressed with the higher mortality in women than in men between 20 and 50.

Prognosis.

Many circumstances affect the prognosis, but the main factors are age, sex, and the standard of efficiency in nursing in operation. Many children escape the disease altogether; those attacked usually get it in a comparatively mild, though characteristic form. Adolescents and young men (of whom we have had few) appear to struggle through the disease satisfactorily. We have had a high incidence of attacks amongst old men and women. After the age of 55 their chances of recovery are much reduced. In the Salonica Hospital, with good nursing and treatment, the typhus mortality was only 5·8 per cent., and the complications were fewer and less severe than in other infectious diseases hospitals. Complications are frequent and serious among those who are badly nursed and cared for; the mortality rises with the degree of inefficiency in nursing. In another infectious diseases hospital visited the mortality was only 7 per cent., and the complications, though serious, were less so than in most other hospitals. In two other infectious diseases hospitals the mortality was 11 and 12 per cent. respectively, and the complications formed the worst phase of the disease; in both these hospitals the nursing was defective. In none of these hospitals were there complete arrangements for protection of the sick attendants, nurses, and doctors from infection. Medical men, nurses, and all sick attendants looking after typhus patients should be thoroughly protected from lice by suitable cotton or linen clothing from head to foot before commencing their work daily, and have a bath and a complete change of clothing after finishing their day's work. Even with these precautions infections will occur during an epidemic, but without them infection is inevitable sooner or later.

Treatment.

When typhus is diagnosed the case should be sent to hospital from the refugee camp at once. To this rule we make but few exceptions; there were instances in which members of our staff were attacked and sent to isolation wards of ordinary general hospitals. It was a great concession accorded to us, and none of these cases proved fatal. The refugees were greatly opposed to our sending their infected relatives to infectious diseases hospitals, but this measure is necessary for the safety of the uninfected. Some definite routine plan must be adopted in admitting typhus fever cases into hospital and distributing them in wards. The first requirement is a receiving room to which all patients are primarily brought. Here the hair of the head is rapidly cut off with a machine clipper, the hair of the axillæ and pubes being shaved off and all hair burned. The receiving room should communicate with the room or other area containing the steam-disinfector on the one hand and with the bathroom on the other; the latter should lead to the dressing-room. After removal of the hair the patient is put on a stretcher and conveyed to the room containing the disinfector. Here everything he brings with him is discarded and disinfected. He is next taken to the bathroom and bathed, and then put on a clean stretcher and removed to the dressing-room, where he receives a suit of clean hospital clothes, being then taken to a ward. This routine must be thoroughly carried out if the wards are to be kept free from infected lice. Nothing that the patient brings to hospital should enter the ward. The carrying out of a similar routine in delousing all inmates of refugee camps is of paramount importance. All these arrangements have, of course, to be improvised in dealing with refugees. The most vitally important measure necessary at the present time is the isolation of all cases of typhus to prevent its dissemination. Thoroughly deloused typhus cases are perfectly innocuous to the uninfected, and if delousing arrangements are quite efficient there is no reason for putting them in separate wards. Personally I have seen no infectious diseases hospital in Greece that inspired complete confidence.

Typhus patients should be kept in bed throughout the pyrexial stage of the disease and for at least a week afterwards. They may be dieted on practically anything they can assimilate; the lowered digestive powers indicate the desirability of giving such foods as soups, jellies, macaroni, porridge, fish, eggs, and so forth. The more simple liquids taken—lemonade, soda and milk, weak tea, &c.—the better. Most physicians in Greece are opposed to the use of antipyretic drugs. If the temperature calls for reduction this is readily effected by cold sponging, or, if a decided effect is required, packing in cold wet sheets. There is great temptation to use aspirin or some other antipyretics; it certainly relieves the main symptoms, but it masks the patient's state and eventually depresses him considerably. In the early stage, when sleeplessness and irritability are present, small doses of morphine give satisfactory results; large doses are to be avoided as they also mask the condition and in later stages are altogether too depressing. The morphine may later on be replaced by paraldehyde or sulphonal if it is called for. The most popular stimulant is hypodermic injections of camphor (gr. 2 to 5 in 1 c.cm. of olive oil or in ether put up in ampoules) every four hours; in severe cases with threatened heart failure it is alternated with digitalin or strophanthin. Though little used in this epidemic I am convinced that the careful administration of alcohol (in the form of brandy or whisky) would tide many cases over the critical period of the disease, the ninth to the fourteenth day. It is too expensive for general use in these cases among refugees. Saline infusion subcutaneously is very commonly used and is well spoken of, as much as 1½ to 2 pints being given daily from an early stage. Some cases die of heart failure during canvalescence, owing t is said, to overstrain of the myocardium, which is seriously nvolved. This involvement of the heart muscle demands are in convalescence ; the only treatment required appears o be a tonic of strychnine, strophanthin or digitalis, and iron, asily assimilable nourishing food, and gentle exercise. Normally cases are kept in hospital 14 to 21 days from the irst day of apyrexia. With great pressure on hospital ccommodation the cases are sometimes discharged at the nd of the first week ; as they are then (if they again become ousy) for some days infectious to those around them, heir freedom from lice must be assured. Eye affections, specially conjunctivitis and keratitis, may to a large extent e prevented by the use of suitable collyria from the beginning ; parotitis, otitis media, and possibly pulmonary omplications may be reduced by the use of gargles, mouthwashes, and swabbing the throat with appropriate antiseptics.

The treatment for typhus adopted in the infectious liseases hospital at Salonica is as follows. *Diet.*—Milk 14 ounces (1 oke) daily, meat soup twice a day, egg-flip wice, lait caillée (yaourt) once a day, sour milk and emonade ad lib. This is the adult diet, modified as required. *Drugs.*—The following are most generally employed : Camphor (gr. 2 to 5) in olive oil (made up in ampoules) every our hours or so subcutaneously after the first week ; adrenalin ne ampoule daily ; spartein and strychnine on alternate lays ; caffein once a day. When necessary, either sulphonal or paraldehyde is used to induce sleep. Occasionally luring the first week small doses of morphine are given to alm the patient. Purgatives are not given ; constipation s the rule, and it is relieved by simple enemata. I was urprised to find so little serious diarrhœa and rectal incontinence in the later stages of serious cases as compared with hose in other hospitals, even our own. For headache and oisy delirium ice is applied to the head ; for high temperature old sponging, and where hyperpyrexia threatens cold heet packing is employed. The eyes are washed with oric acid lotion, the mouth with an antiseptic, and the throat wabbed every four hours ; a gargle and mouth-wash are iven if the patient can use them. Since this latter routine as been adopted complications have greatly decreased. aline solution is infused into the subcutaneous tissues twice day or so, 12 ounces at a time. Serum treatment is not dopted. A trial was made of defibrinated typhus blood ncubated for three days at 37° C. with ox-gall, and then eated to 60° C. for two hours. The dose given was 2 c.cm. nce a day. It was used in 50 cases with no obvious good ffects and then abandoned. Massage is looked upon as a aluable accessory to the treatment and is carried out in very case twice a day.

Very little is done in this epidemic in connexion with pecific treatment by the use of sera of typhus convalescents.

Prophylactic Inoculations.

A lasting immunity to typhus is established by a previous ttack. In Asia Minor and the Levant generally typhus is lmost endemic, and it is probable that many of those refugees ho have escaped in the present epidemic have acquired mmunity by a previous attack in childhood. It is possible, lso, that an immunity of limited duration may be acquired y the inoculation of the virus of the disease obtained from yphus cases in the early stage of the disease. As a substitute for a prophylactic vaccine the blood of typhus fever ases has been inoculated and the virus thus introduced in living state. The killed virus is used here.

Inoculation against typhus is being adopted in Greece ; is at present experimental, and, of course, voluntary. was inoculated a few days after my arrival in Greece and ow all employed on British Red Cross work have been done. here is absolutely no reaction. Dr. Georges Blanc, irector of the Institut Pasteur Hellénique, who is on pecial duty in connexion with this work, tells me that he has ot heard of any inoculated person acquiring the disease, ut expresses no opinion regarding its prophylactic effects present. I understand that if favourable reports regarding s value are forthcoming in due course, the Greek Government propose making inoculation compulsory among fugees occupying infected areas.

Prevention.

The carrying out of preventive measures in a refugee camp comparable with nothing met with in ordinary civil or ilitary life in the United Kingdom ; the closest approach to I know of is work among famine-stricken areas in India. far as the area allotted to the British Red Cross is concerned, the typhus epidemic is now well under control, and is anticipated that the disease will die out within the next ur or five weeks. It is beyond the power of human effort mpletely to eradicate it under existing circumstances. our jurisdiction we have had only three cases during the st 19 days. I confess that initially I had hoped for more dical results, but I had not then had my later disappointing perience in all work where Greek refugees form part of the ganisation. With regard to our particular charge in and ar Athens I recently wrote to the British Red Cross in London that throughout March much energy was concentrated in endeavouring to reduce, if not eradicate, the typhus epidemic among our refugees. It was recognised that while the typhus outbreak lasted there must be a great deal of apprehension among the refugees themselves and a certain amount of risk to the staff in their daily work. A sight deserving of permanent record is that of the British nursing sisters examining the heads and clothes of the refugees for lice and nits, and coercing the hosts of these insects against their will to be de-verminised in the bathrooms. All men's and boys' heads were shaved, and all girls up to the age of 14 had their hair bobbed. All cases of actual typhus, of course, had their heads shaved. These were severe measures and led to some mutinous display among the refugees, but this exhausted itself when it was recognised that these were compulsory measures adopted for their personal safety. Our nursing sisters also used on the heads of the refugees in camp the mixture of equal parts of kerosene and olive oil we employ to free nits from hair, and they distributed N.C.I. powder (naphthalene 96 parts, creosote 2 parts, iodoform 2 parts), which was in little bags to be worn continuously for a week, when a fresh bag is issued. The idea is that the heat of the body helps to vapourise the ingredients and creates a louse-destroying atmosphere next the skin and clothes.

I believe it to be well worth while in every camp to endeavour to educate the people in regard to the nature of typhus and the principles that underlie its eradication and prevention. We placarded leaflets in this connexion and also had them read out periodically for the benefit of the illiterate. We also posted up such short notices as : "Lice cause typhus fever" ; "It is disgraceful to have lice in the head," and so on.

The specific measures now indicated appear to be—(1) dispersion of refugees from overcrowded towns to rural areas as much as possible ; (2) an increased supply in many towns of water which should be available to, or at least be within easy reach of, every house. In some camps the water-supply is decidedly defective, and bathing arrangements, steam-disinfection of clothing and bedding, and ordinary laundry-work are seriously interfered with. The Greek administration is endeavouring in all possible ways to remove this difficulty.

Every effort to quarantine contacts has failed, which, all things considered, was to be expected. All we want is that the contact should be definitely watched for 21 days, the time laid down as the maximum incubation period. We endeavoured, as far as was possible, to render these certificated people free from lice ; we felt that if thus free they could not communicate typhus, even if they acquired it themselves in the meantime. The quarantining of contacts in a small country which contains over a million and a quarter of refugees, many thousands of whom are contacts and are either in search of work or have daily to pass in and out of the camps to and from their work, is an impossibility. We hope that during the summer the epidemic will come naturally to an end by cessation of the multiplication of lice in unfavourable meteorological conditions, and that by the beginning of the next typhus season the economic and other conditions at present antagonistic to preventive work will have altered for the better.

PREVENTION OF DECAY OF TEETH.

A LEAFLET for the use of parents, dealing with the causes of decay in teeth and its prevention, has just been issued with the approval of the Council of the Society of Medical Officers of Health. The leaflet reads as follows :—

Decay of teeth is caused by the fermentation of food that sticks on or between the teeth after meals. Acid is formed from the food, and this acid eats a hole into the teeth. It is only the "starchy" and "sugary" foods (see below) that form acid in the mouth.

It is most important that the jaws should be well grown and the teeth regular. This is brought about by breathing through the nose from birth onwards and by chewing and gnawing. If the jaws are small and the teeth overcrowded, mastication (chewing) cannot be properly performed, and the food will be left clinging to the teeth after meals and the teeth will decay.

Seven Rules.

In order that the jaws and teeth shall grow properly and the teeth kept clean and free from decay, you should observe the following rules :—

(1) As soon as an infant needs food other than milk (8 to 9 months) give it in a solid form, such as crusty bread, twice baked bread, or crisp toast, thus compelling mastication. Do not give bread soaked in milk or milk thickened with flour or other starchy foods, such as most patent foods. Encourage the child to chew and see that it breathes through its nose. In these ways good habits of mastication will be formed.

(2) As the child grows up you should still give most of the food in a solid form, compelling mastication. Food, other than milk, should rarely be taken in a liquid form. Vegetables and meat should not be minced and soaked in gravy. Bread should not be eaten new, and it should have plenty of good firm crust.

(3) After the first two or three years of life the child should have three meals a day and no food between.

(4) It is not advisable to drink at meal times, but plenty of water should be taken between meals. Milk is a food, and should only be taken at meal times, and must be followed by a tooth-cleansing food.

(5) All meals should be finished with a cleansing food (see below).

(6) Sweets, chocolates, and biscuits are very harmful to the teeth, if taken the last thing at night. They should only be taken at meal times, and should be followed by a cleansing food. The custom of giving milk and biscuits the last thing at night should not be allowed.

(7) Correct feeding and chewing are the best means of preventing decay of the teeth, though the intelligent use of the toothbrush will be found helpful.

If decay of the teeth or tenderness of the gums is noticed, the child should be taken to a dentist. Such conditions prevent mastication and bring about further decay. It is important for the sake of the child that the nursing and expectant mother should also go to the dentist if her teeth are in a bad condition.

Examples of the Various Kinds of Food.

Starchy Foods.—Potatoes; rice, tapioca, sago; bread, biscuits, &c.; oatmeal porridge; most patent foods.

Sugary Foods.—All foods to which sugar is added; sweets of all kinds; honey, syrup, jams, marmalade; milk.

Tooth Cleansing Foods.—Fresh fruits: apples, oranges, nuts; raw vegetables: lettuce, watercress, celery, radishes, onions; crusts[1] of bread, crisp toast, twice-baked bread; meat, fish, bacon.

The leaflet may be obtained from John Bale, Sons and Danielsson, Ltd., 83–91, Great Titchfield-street, London, W. 1., price 1*d.* each, 3*s.* 9*d.* for 100.

TEREBENE TOILET SOAP.

TEREBENE (Terebenum) is a well-known powerful antiseptic, disinfectant and deodorising liquid and its distinctive smell makes it particularly suitable for combination with toilet soap. The glycerine soap supplied by Messrs. F. S. Cleaver and Sons, Ltd., Honey Soap Works, Twickenham, Middlesex, a sample of which has reached us, has behind it a reputation of 50 years, and its soothing and antiseptic qualities recommend it as excellent for the toilet. Attention has already been drawn in these columns to the value of "Talcum," also supplied by this firm, as a pure talc powder for use in the nursery and wherever a dusting powder of this kind is indicated.

QUEEN MARY'S CONVALESCENT AUXILIARY HOSPITALS, ROEHAMPTON.

A STATEMENT has been issued by the committee of the hospitals dealing with the work accomplished therein from 1915 to 1923, and with plans for the future. Approximately 41,000 men required artificial legs and arms as a result of the war; the majority of these cases were dealt with at Roehampton House, opened on June 28th, 1915, with 25 beds, and later increased to 224 beds in October, 1915, to 550 beds in June, 1916, and to 900 beds in June, 1918. Since June, 1915, nearly 23,000 new patients passed through the hospitals, and over 47,000 cases were readmitted for second limbs and repairs. In addition, since January, 1918, nearly 20,000 cases were dealt with through the post. In 1916 instructional workshops and an employment bureau were opened in connexion with the institution; 8453 men received training in various trades and commercial classes, employment was found by the bureau for 4987 men on discharge from hospital, and for 4166 men arrangements were made for training in various trades after discharge from hospital. The instructional workshops are now closed as, happily, most of these disabled men have found suitable employment.

Now that practically all officers and other ranks have received their duplicate limbs the number of in-patient beds is 250. The out-patient department has, however, increased very considerably; the average attendance is about 52 per day, rising in busy seasons to as many as 90. Dover House (adjoining Roehampton House), for the use of officers, is now closed, and arrangements have been made for their accommodation at Roehampton House, where 13 beds are available. In consequence of the number of surplus beds, arrangements are being made with the Ministry of Pensions for the accommodation of 500–600 general medical and surgical cases from the Special Surgical Hospital, Shepherd's Bush, which is closing at the end of the year. This will necessitate a further large capital expenditure for the alteration of existing huts and the erection of new semi-permanent wards, operating theatres, &c. The care of the limbless patients is in no way to be interfered with by this arrangement, and it is hoped to further extend the benefits of Roehampton to a limited number of railway employees and others who have the misfortune to lose their limbs in the course of their employment.

It is hoped that support by donations and endowment of beds may continue, so that the committee may be able, with the help of the capitation grant received from the Government, to maintain the institution in its present high state of efficiency. The hon. treasurer of the hospital is Sir Charles H. Kenderdine, K.B.E., 12, Little College-street, London, S.W. 1.

PUBLIC HEALTH IN SOUTH AFRICA.

THE Official Year Book of the Union of South Africa[1] contains a chapter devoted to public health and hospitals in the Union. The history of public health prior to the Union and from 1910 onwards is briefly traced, and particulars are given as to the appearance and prevalence of certain diseases, among which are the following: Cholera has twice appeared since 1888 in ships bound from Asiatic ports, but no epidemic has occurred on land. Diphtheria occurs throughout the Union, especially during the colder months, but serious outbreaks are rare. Bacterial dysentery of a mild type is not uncommon in summer, but amœbic dysentery is comparatively rare. The annual notifications of typhoid or enteric number between 4000 and 5000. South Africa suffered heavily during the influenza epidemic of 1918, there being 139,471 deaths up to the end of November of that year. Leprosy, which existed among the Hottentots before the arrival of Europeans at the Cape, had been separately dealt with by several of the component States before the Union came into being; the total number of lepers of all races segregated at the end of 1918 was 2230, and the number of unsegregated lepers is estimated to exceed 1000. Malaria is endemic in parts of Zululand and of the Transvaal, and at times becomes epidemic over wider areas, but European settlements and increase of cultivation and drainage is circumscribing the areas where the disease is endemic. Plague was unknown before 1899, but since that date numerous small epidemics have occurred, chiefly traceable to rats in shipping from India and South American ports. Small numbers of deaths were reported almost annually from 1912 to 1921, but no infections in rodents or other animals were discovered. In 1921 the existence of epizootic plague in certain wild rodents in the Orange Free State was established. There have been many severe epidemics of small-pox since the introduction of the disease in 1713; after the Cape Parliament Public Health Act of 1883 was passed and vaccination became compulsory, the outbreaks have almost all been of the mild "amaas" or "kafir-pox," so called because natives are chiefly affected. Tuberculosis, widely disseminated when from about 1880 onwards tuberculous Europeans began to come out to the dry elevated highlands of the interior, is now prevalent among the coloured and native population. As regards sanitation, considerable attention has recently been paid to water-supply, sewerage, public slaughter-houses, &c., in most smaller towns and in many villages. Maternity and child welfare is attracting an amount of interest which has greatly increased during the last few years. Most municipalities and some other local authorities have health officers and departments attached to the local authority, which is responsible for control of sanitation, outbreaks of infectious disease, &c.; health and medical work, for which the Union Government is responsible, is carried out by means of medical officers known as district surgeons, a few of whom in large centres are whole-time officers, the remainder combining part-time Government work with private practice. In each seaport a port health officer is appointed by the Union Department of Public Health (established 1919) to carry on the health inspection and control of vessels, and to assist immigration officers, in an advisory capacity, with regard to the physical fitness of immigrants to enter the Union. Tuberculosis is specially cited as a disqualification, special permission being required for a person suffering from the disease to enter the Union. Other sections of the Year Book are as useful and accurate as is the chapter here summarised.

FOR an extension of Bury Infirmary, to take the form of a children's hospital and to serve as a war memorial, over £40,000 are in hand. About £10,700 will be expended on the building, and the balance, which it is hoped to raise to £30,000, will be devoted to endowment.

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[1] The coarse whole-meal flour is best for this purpose.

[1] And of Basutoland, Bechuanaland Protectorate, and Swaziland. Fifth year. 1922. Pretoria: Government Printing and Stationery Office. Price 5s.

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CONTENTS

THE WHOLE OF THE LITERARY MATTER IN THE LANCET IS COPYRIGHT.

ST-GRADUATE LECTURES on the Surgery of the Thyroid Gland. By A. J. WALTON, M.S., F.R.C.S. Lecture II. Exophthalmic Goitre .. 267

ORIGINAL ARTICLES.

e Ætiology of Kala-Azar and Tropical Sore. By B. BLACKLOCK, M.D., D.P.H., D.T.M. 273
hler's Disease of the Tarsal Scaphoid. By H. H. GREENWOOD, B.S., F.R.C.S.—(*Illustrated*) . 274
mphysiotomy, Craniotomy, and Cæsarean Section. By A. E. HISHOLM, F.R.C.S. ... 276
berculosis of the Pericardium. By W. E. VALLER, M.D., M.R.C.P. 278
olarship in Medicine. By Sir HENRY MORRIS, art., M.A., M.B. 314

NICAL AND LABORATORY NOTES

e on "Bakers' Eczema." By ARNOLD ROWSBY ANKARD, F.I.C. 279
nia of the Vermiform ppendix through esselbach's Triangle. y MARGARET W. NODGRASS, M.B., .Ch. 280

IEWS AND NOTICES OF BOOKS.

Older Universities of ngland: Oxford and ambridge. By Albert ansbridge 280
traception (Birth ontrol): its Theory, istory, and Practice. y Marie Carmichael topes, D.Sc., Ph.D. ... 281
pendium der topischen ehirn- und Rückenarksdiagnostik. By rof. Robert Bing 281
ercle Bacillus Infection d Tuberculosis in Man d Animals. By Albert lmette. Translated by . B. Soper, M.D., and H. Smith, Ph.D. 281
té technique d'hématogie, morphologie, histonèse, histophysiologie, stopathologie. Par J. lly 282
Ventilation of Public ildings. By Robert yle 282
Calculations in Heating and Ventilation. By G. S. Coleman, D.Sc. 282
Delafield and Prudden's Text-book of Pathology. Revised by Frances Carter Wood, M.D. 282
Spezielle Chirurgie. Part II. By Prof. G. Sultan 282
Nouveau traité de médecine. Vol. XV. Glandes salivaires, pancréas, et péritoine. Edited by G. H. Roger, Fernand Widal, and P. J. Teissier 282
Tropical Diseases Bulletin. 282

NEW INVENTIONS.

A Laminectomy Retractor (Mr. C. P. G. Wakeley) —(*Illustrated*) 286
Invalid's Bedside Table (Dr. A. Campbell Stark) —(*Illustrated*) 286

LEADING ARTICLES.

EXOPHTHALMIC GOITRE... 287
PHYSICAL RESEMBLANCE IN CASES OF DISPUTED PARENTAGE 287
THE MECHANISM OF ALIMENTARY SECRETION 288

ANNOTATIONS.

President Harding 289
Industry and Health..... 289
An Irish Poor-law Hospital Scheme 289
Splenic Anæmia 290
Non-Traumatic Diaphragmatic Hernia.......... 290
The Teaching of Surgery by Kinematographic Films 290
The Experimental Reproduction of Malaria..... 291
Sailors and Venereal Disease 291
The Use of Thymus Extract as a Therapeutic Agent 291
The Corpus Luteum after Hysterectomy 292
The Rôle of Pulex Irritans in the Spread of Bubonic Plague in Great Britain 292
Miners' Nystagmus: The Question of Compensation 292
Small-pox in England and Wales 293

OBITUARY.

Flora Murray, C.B.E., M.D., B.S., D.P.H.—(*With portrait*)......... 306
Walter William Chamberlain, M.D., C.M. 307
Andrew Stewart, L.R.C.P. 307

MODERN TECHNIQUE IN TREATMENT.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

XXXII.—Treatment of Exophthalmic Goitre and Other Forms of Hyperthyroidism. By Prof. GEORGE R. MURRAY, M.D., F.R.C.P. 293

SPECIAL ARTICLES.

The Medical Register: Untraceable Practitioners, H to O 283
International Uniformity in Pharmacopœial Preparations: Some New Suggestions 285
British Dental Association: Annual Meeting at Manchester 294

BRITISH MEDICAL ASSOCIATION.

Annual Meeting at Portsmouth.

Section of Surgery: Treatment of Obstruction of the Colon.—Treatment of Acute Primary Infections of the Hand.—Anæsthetics from the Surgeon's Point of View 295
Section of Public Health: Infant Mortality.—Effect on Health of Sewer Air and Drain Air......... 302
Exhibition of Instruments, Drugs, Foods, and Appliances 304

CORRESPONDENCE.

Medical Charities (Sir Charters J. Symonds) .. 307
The Imperial Cancer Research Campaign and the Cancer Problem (Maj. Leonard Molloy, M.P.) . 308
Cancer Facts and Theories (Prof. Charles Walker).. 308
Ophthalmological Training for Medical Students (Dr. C. O. Hawthorne) . 309
Physical and Recreational Training (Mr. Harold Burrows) 309
An Epidemic of Erythema Nodosum (Dr. George Pernet) 309

INDEX NOTICE.

THE LANCET, Vol. I., 1923 316

PARLIAMENTARY INTELLIGENCE.

Notes on Current Topics: Adjournment of Parliament 310
House of Lords: Dentists Bill 310
House of Commons: Public Health.—Cost of Inmates of Poor-law Institutions. — Venereal Disease Disinfectants.—Deaths from Measles.—Advertisements on Medical Certificates.—Vaccination and Small-pox. —Maternity and Child Welfare Centres.—Deaths of Women in Childbirth.—Tuberculosis in the Navy.—Grant for Combating Venereal Disease. — Oxford and Cambridge Grants 310

THE SERVICES.

Royal Naval Medical Service. — Royal Army Medical Corps.—Royal Air Force 309

MEDICAL NEWS.

University of Edinburgh.. 312
East Sussex Hospital..... 286
Blending Butter and Margarine 307
Prudential Assurance Company and Medical Research 312
London Hospital 313
St. Thomas's Hospital Medical School 313
Fellowship of Medicine and Post-Graduate Medical Association 313
Wallsall M.O.H.: A Compromise Reached 313
Royal Northern Hospital . 313
Donations and Bequests . 313
London (R.F.H.) School of Medicine for Women ... 313
Public Health Legislation in the Irish Free State.. 313
Medical Charitable Society for the West Riding of Yorkshire............. 313

NOTES, COMMENTS, AND ABSTRACTS.

Feminine Psychology 315
"The Fight Against Disease" 316
Popular Endocrinology ... 316
Public Health in Nigeria.. 316
The Peking Union Medical College 316

Appointments 313
Vacancies............... 314
Births, Marriages, Deaths. 314
Medical Diary 316

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Delivered at the London Hospital on June 8th and 15th, 1923,

BY A. J. WALTON, M.S. LOND., F.R.C.S. ENG.,
SURGEON, LONDON HOSPITAL.

LECTURE II.*—EXOPHTHALMIC GOITRE.

THE problem of Graves's disease or exophthalmic ɔitre is even more difficult of solution than the roblems of colloid goitre or of simple adenoma. here are so many gaps in our knowledge of this ysterious disease that agreement is far from being ached as to its nature and cause. As McCarrison[21] as pointed out, there has been little or no study of its ɔidemiological nature, and although much is known the distribution of endemic goitre there is at resent no such knowledge of a similar distribution Graves's disease. In England there are two distinct ɣpes—those which supervene on colloid goitre, and ıose which start in previously normal people. The rmer is the less common, and in endemic areas ıch as Berne and the Gilgit and Chitral Valleys, arau and McCarrison[21] have shown that this variety distinctly rare. In it the ætiological factors of ereditary and general infection will be similar to ıose of colloid goitre, but in the primary variety ıey appear to have a less definite bearing.

PATHOLOGY.

Moebius[25] first put forward convincing evidence show that the disease was dependent upon excessive cretion of the thyroid. Since that time evidence as been accumulating that the symptoms are always ssociated with a change in the gland. From time time cases are described in which there is no sible enlargement of the thyroid, but, as Kocher[18] ıd Berry[4] have shown, no one has ever demonstrated ıat a case of Graves's disease can occur with a normal ıyroid. The size of the thyroid will vary consider-ɔly according to whether there has been a previous ɔlloid enlargement or not. To the naked eye three stinct varieties may be recognised, and it is well distinguish these since they are associated with somewhat different symptom-complex. For con-enience one may describe these three varieties as ıe colloid type, the vascular type, and the nervous ɣpe. The first variety has very similar character-tics to that of a colloid goitre. There is a much ılarged smooth mass which is semi-transparent from ıe presence of colloid, but on section there has been considerable proliferation of the epithelium, and ence the colloid spaces are not nearly so distinct ɣen to the naked eye. Remains of the distended esicles are, however, seen scattered throughout the ıt surface, and in some cases the cellular change ay not be sufficiently pronounced to be noticeable the naked eye, the gland then appearing to be simple colloid goitre. The vascular type, which is und more commonly in relatively young women, ıows also a smooth uniform enlargement of the whole and, but to a less degree than that which super-enes on a colloid goitre. The cut surface shows a ıiform granular or fleshy appearance, so that mani-stly it is richly cellular. Little or no trace of colloid ın be seen. The third or nervous type is a rather ıaller thyroid which is found more commonly in ople of a later age, generally at or about the meno-ıuse. Not only is the gland relatively smaller, ıt it is rather more irregular and nodular. The ıt surface has a much more lobulated appearance, that portions of the gland stand up and give mewhat the appearance of multiple small adenomata. ıey have, however, no definite capsule, although the ɔrous stroma is more in evidence and bands of fibrous tissue pass between the adenomatous masses. As with the vascular thyroid, each of these areas is finely granular and shows little or no colloid. All three varieties are extremely vascular. At operation they are found to have enormously dilated veins and very large arteries, and the cut surface bleeds with extreme freedom. The microscopic section shows a very characteristic appearance. A well-established case will show a very great cellular hyperplasia. So great will have been the proliferation of the cells lining the acini that in the greater part the gland will appear to be a solid cellular mass. Here and there, however, small acini can be seen. Even in these there is some proliferation of the epithelium with infolding of the walls of the acini. In these spaces there is a small amount of poorly-stained colloid. If the change has supervened upon a colloid goitre there will still be the large spaces containing colloid material, but there will be very considerable proliferation of the interacinar epithelial cells and some proliferation in the acinar walls with consequent infolding. The characteristic microscopic picture, therefore, is a great increase of the epithelial elements and the presence of only a small amount of poorly-stained colloid. Occasionally an exophthalmic goitre may be associated with an adenoma, a condition which must be sharply distinguished from the mild amount of hyperthyroidism which is found with a fœtal adenoma. That portion of the thyroid, apart from the adenoma, will always show much cellular proliferation, whereas the adenoma may be of the colloid type. In the fœtal adenoma the proliferation is limited to the encapsuled growth.

ÆTIOLOGY.

Like other diseases of the thyroid, this condition is much more common in females than in males. In my own series[31] there were 129 females and only 10 males—that is, a proportion of 13 to 1. Sir Hector Mackenzie[23] found in his series that the proportion was 10 to 1, and this is the figure usually accepted. Murray,[26] however, made the interesting observation that in his recent figures the proportion of males is increasing, for whereas in 120 cases up to 1903 the proportion was 10 to 1, in 300 cases between 1911–21 there were only three females to one male. He raises the interesting suggestion that as the modern male is becoming more highly-strung and nervous in character, so he may be becoming more prone to exophthalmic goitre. My own figures, however, have not shown any such increased tendency in the male, but my patients, being mainly drawn from the hospital out-patient department, may not have shown the degenerative effects of civilisation to so marked a degree. Heredity seems to be a much less important factor in this variety than in the others. In Sir Hector Mackenzie's series[23] there was some family history in 10 per cent. of the cases. This is considerably less than that of the colloid goitres, where even in this country some 25 per cent. of the cases have one or more members of their families affected.

The age-distribution is somewhat similar to that of a colloid goitre, and like the sporadic cases of that disease it is rare to find the condition in young children. Sir Hector Mackenzie[23] in his series found there was one patient of 10 years of age, the others were all over 14. Attention has already been drawn to the fact that two distinct varieties of the disease may be recognised, and this is also seen in the age incidence. The vascular type is much more common in young people, and in my own series accounted for about half of the cases, their age of onset being between 15 and 25. The other or nervous group is commoner at a later age and is generally seen commencing between 35 and 45. It is of interest to note in Sir Hector Mackenzie's series[23] that in his hospital cases half of the patients were under 25, whereas in his private cases less than one quarter began before this age. It would seem, therefore, that the more well-to do portion of the population are more prone to suffer from the nervous type. This may be due to the fact

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[*] Lecture I. appeared in THE LANCET of July 14th, p. 53.

that such people are more subject to mental disturbance, which has long been noted to be a potent factor in the development of the disease. Very frequently one obtains a history that some severe mental stress, such as a shock or fright, or even prolonged mental worry, immediately preceded the onset of symptoms. During the late war a large number of cases of hyperthyroidism were seen in soldiers who had been exposed for a long period in the trenches, and in this country I have in my own series met with several cases who dated their disease back to a fright received during an air-raid. Sir Hector Mackenzie[23] found that in his series some serious mental disturbance was present in one-third of all the cases.

The relationship of an acute or chronic infection to this disease is not nearly so clearly established as in the case of colloid goitre. The researches and experimental work of Farrant[13] have, it is true, shown that after exposure to an acute infection or to an acute toxæmia changes occur in the thyroid gland which are identical with those seen with exophthalmic goitre. There is, however, as a rule, no clinical evidence of hyperthyroidism, and none of manifestations which are found associated with this disease. The relationships of intestinal infection cannot yet be regarded as proved, although McCarrison[21] believes that it is a very important factor. It is true that in many cases the symptoms date back to some acute infection such as influenza or rheumatic fever, but such a disease might act in much the same way as any mental disturbance rather than from the effects of the infection. Cases have been reported where the patient has been cured by methods directed to the improvement of intestinal stasis or the removal of some other source of infection such as may be found in the tonsils or teeth. Such cases are very few in number and it cannot yet be said that infection has been proved as a cause of the disease. McCarrison[21] has also laid stress upon the importance of malnutrition as a causative factor, but that such a condition is not an essential cause of the disease is shown by the fact that many cases occur in well-fed and otherwise healthy people, and there is no evidence at our disposal to show that the disease is more common among the poor.

CAUSE OF SYMPTOMS.

Much discussion has from time to time centred around the cause of the very diverse symptoms which occur with exophthalmic goitre. The older views that the disease was due to some lesion of the restiform bodies, which was based on the experiments of Filehne,[14] or of the sympathetic system, have little if any evidence to support them, and are now disregarded. The three views which are supported to-day are that the symptoms are due (1) to hyperthyroidism, (2) to dysthyroidism, (3) to pluriglandular disturbance. It will be manifest that whichever of these three theories is accepted, it will still leave unsolved the reason as to why there is a disturbance of the thyroid or of the other glands of the endocrine system. This change may still be caused by infection, by mental stress, or some other factor at present unknown. The belief that the symptoms are due to a pluriglandular upset has at first sight a considerable amount of evidence to support it. It is realised that in many cases of exophthalmic goitre and also of hypothyroidism there are changes in the pituitary gland and often evidence of interference with the activity of suprarenal glands. Moreover, the close relationship between the changes in this gland and periods of ovarian activity in the female will support this view. Strong evidence has also been brought forward to show that the thymus is as much or even more responsible for the symptoms as is the thyroid. Crotti and Bowen[9] as well as Capelle and Bayer[6] have strongly supported this view. All those who have had an opportunity of seeing post-mortem examinations upon examples of this disease will support Berry's statement[4] that in no such examination can one fail to notice an enlargement of the thymus. Bircher[5] states that he has been able to produc symptoms of the disease by grafting human thym tissue into the peritoneal cavities of dogs. Garre even advises operation upon the thymus gland as cure for exophthalmic goitre. Such views have no however, received general acceptance, and it is qui possible that the changes in the other glands of th endocrine system are secondary to those of the thyroi gland. The experimental and clinical evidence tha the symptoms are due to a hyperthyroidism is great that this view is generally accepted to-day, an it is upon its acceptance that the value of surgica treatment is based. The evidence may be summarise as follows: It has already been shown that Moebius, Kocher,[18] and Berry[4] have demonstrated that the are always pathological changes to be found in th thyroid in Graves's disease, even when the gland not clinically enlarged. A large number of exper ments have been carried out upon animals. Edmunds and Baruchi[3] were able to produce typical Graves disease in a large series of monkeys, dogs, rats, an rabbits by administrating large doses of thyroi obtained from ordinary human goitre. These result have since been confirmed by French.[15] Considerabl discussion has, however, arisen in the case of othe experiments because it is difficult to determin accurately how far symptoms produced in anima are really analogous with Graves's disease in me Klose, for instance, found that extracts of thyroi from cases of Graves's disease gave rise to differer symptoms than extracts of normal thyroid whe injected into animals, and Carlson[7] claimed that th symptoms which were produced were not those exophthalmic goitre. Hence these observers an many clinicians to-day believe that the symptoms exophthalmic goitre are due not so much to a hype thyroidism as to a dysthyroidism. The more recen experience of de Quervain[10] would seem to show however, that rats fed with the thyroid of exoph thalmic goitre show the same hypersensitiveness t a deficiency of oxygen as when fed with th thyroid of an ordinary goitre, only to a muc more marked degree. In addition to the exper mental evidence there is a considerable amour of clinical observation which supports this view and cases have been reported in which larg doses of thyroid extract have been taken and hav given rise to a typical picture of Graves's diseas Von Notthaft's well-known case[30] was one in whic a man took excessive doses of thyroid extract as cure for obesity and developed typical symptom Sir James Barr[2] reports others where sympton followed excessive doses of tincture of iodine, an many cases, including those reported by Ball Kocher,[19] and Pineles,[28] have been recorded of hype thyroidism following the use of thyroid extract i the treatment of simple enlargement of the thyroi The pathological work of Wilson[37] and MacCarty, who showed that the amount of cellular proliferatio was in direct proportion to the extent of the hype thyroidism, would support this same view. In th previous lecture stress has been laid upon the fac that adenomata of the fœtal type may give rise t symptoms of hyperthyroidism, and Dunhill[11] an Berry[4] described cases where similar symptoms hav occurred in association with parenchymatous goitr Any surgeon who has operated on a large numbe of thyroids will have met with cases where typical exophthalmic goitre has become grafted upo a colloid goitre, and will have found that in thes cases there is in addition to the colloid change definite proliferation of the thyroid epitheliun Symptoms of a similar nature may occur with carcinoma of the gland. A well-known example this is the case reported by Clunet.[8] The goo results which so often follow the operative remov of a portion of the enlarged gland lend very stron support to this view. It is true that many investiga tors, among whom may be mentioned Huber, hav laid very special stress upon the fact that certai cases fail to be cured by operative treatment. Tha this is so will be endorsed by all surgeons of experienc it it must be remembered that the amount of gland hich is removed at operation is very empirical, and is often necessary to remove an amount which is sufficient to cause a cure simply because a larger peration would be fraught with considerable danger. all large series such as those reported by Dunhill,[11] ocher,[20] and Halsted,[17] and I may say also in y own series,[31] there have been examples in which e first operation has caused only an amelioration. urther operation has been necessary, but with the ore extensive resection a complete cure has been tained. It may be said, therefore, that the balance evidence to-day strongly supports the view that the mptoms of exophthalmic goitre are due to a hyper-yroidism. It must be realised, however, that this not a full explanation of the disease, for although ere is a certain amount of evidence that this hyper-yroidism is itself dependent upon infection, our owledge of the cause of the hyperactivity of the yroid is at present incomplete, and although to-day erative removal may be the most satisfactory eatment, one is led to hope that in the future the use of the excessive activity of the thyroid will be scovered and will be corrected so that operation ll no longer be necessary.

SYMPTOMS.

The symptoms of this disease are manifold. The yroid itself is generally enlarged, but the extent of e enlargement will vary very considerably. It is ost in evidence in those cases which are secondary a colloid goitre, and here, indeed, it may be the mptom of which patients chiefly complain. In the scular type the thyroid is also considerably more larged than the nervous variety. Thus it is that a general rule the younger the patient the larger e thyroid, and indeed in some of the more elderly ses the gland may be so slightly enlarged that it is t palpable. These cases are often described as aves's disease with no goitre. The enlargement is a rule uniform, although one lobe may be slightly gger than the other. In a well-established case, pecially in the vascular type, the anterior and ternal jugular veins are prominent and pulsate ely. The rapid beat of the carotid vessels is very anifest, and in some cases an actual expansile lsation may be seen in the gland itself. Palpation the upper poles will nearly always reveal a definite rill, and in this position a murmur may be heard th a stethoscope.

There are usually very distinct ocular symptoms. e eyes are more prominent, the exophthalmos being en quite early in the disease. There has been much scussion as to what is the actual cause of the ominence of the eyes, but the evidence to-day, as irray[26] has shown, would seem to point to its ing largely due to an increase of intra-orbital fat. hatever is its origin, it is one of the last symptoms disappear when the patient is cured. Associated th the exophthalmos are certain physical signs. ellwag's sign is the presence of a visible ring of erotic around the cornea. Von Graefe's sign is the bility of the upper lid to follow the eye when it is ected downwards, so that if the patient looks down wards her feet there is a wider ring of visible erotic above the cornea. Moebius's sign is the bility of the eyes to converge in accommodating for ar objects, and Joffroy's sign is the failure of the ehead to wrinkle when the patient looks up. Less nmonly there may be weakness of the ocular iscles, so that there is slight dropping of both upper elids, and occasionally even paralysis of one or other ternal rectus, giving rise to double vision. It is portant to remember that when the proptosis is treme the patient may be unable to close the eyes, d under these circumstances the cornea may erate, so that in many advanced cases there has en an extreme ulceration going on to sloughing of cornea, with perforation and even complete struction of the eye.

The circulatory symptoms are always a feature of the ease. The patient quite early in its progress will complain of palpitation and dyspnœa, which is always greatly increased on exertion or excitement. It will be found that the pulse is raised to 110 or 120 per minute even in mild cases. In the more severe periods of the disease it is often raised to 160 or sometimes, indeed, may be uncountable. Even at this period it will be noticed that the heart's apex beat is displaced outwards and is very forcible, so that it is diffused over a large area of the thorax. At first the sounds are clear in spite of the heart's rapidity, or there may be characteristic hæmic murmurs. Later on the cardiac muscle suffers, so that the pulse becomes irregular and there is evidence of auricular fibrillation. In several of my more advanced cases Dr. J. Parkinson found an advanced stage of this condition, a change which will only improve to a slight degree even when the hyperthyroidism is brought to an end.

The skin and its appendages also show very definite changes. These patients are prone to flush on the slightest exertion or excitement, and when first seen often show a characteristic appearance owing to the irregular and blotchy erythema of the face and neck. The sweat-glands are nearly always over-active, the constant moisture of the skin causing the patients considerable annoyance. They stand the heat badly and nearly always much prefer the winter months of the year. It is important to recognise the evil effects of heat, not only in causing an exacerbation of the disease, but because of the increased risks of operating during the hotter periods of the year.[31] Later on in the disease there are nearly always pigmentary changes, small irregular patches of dark-brown pigmentation appearing on the arms, chest, and abdomen. They are more marked in that frequently the patient shows a certain amount of general anæmia. The appendages of the skin are also affected. Nearly always these patients will complain of their hair falling out, and I have observed several cases in which there have been patches of alopecia appearing both before and after operation. In some cases this condition has progressed until very nearly complete alopecia has resulted. Dr. J. H. Sequeira has called special attention to this condition.

The above group of symptoms are most marked in that variety of the disease which I have described as the vascular type. These patients are usually relatively young. The condition has frequently started shortly after puberty. They show considerable enlargement of the thyroid gland, advanced exophthalmos, a rapid pulse, and very increased sweating. The other symptoms about to be described are also present, but, with the exception of amenorrhœa, are less in evidence.

Nervous symptoms are always present to some degree, and may indeed be the first indication of the onset of the disease. Some of these patients have first noted that they were startled and excited when spoken to, and at times indeed the first changes noticed may have been that they showed a tendency to drop articles when carrying out their household duties. They are always manifestly upset by the medical examination, and often have a difficulty in giving an account of their symptoms. This nervousness has been specially noticed in those cases of slight hyperthyroidism found in soldiers after long exposure to trench warfare, who later developed other evidence of hyperthyroidism. There are also well-marked physical changes on the nervous side. The patients show a fine rapid tremor in the extended hands. It affects, however, the whole limb and is present in the extended tongue. Sometimes it may be sufficiently marked to interfere with the patient's work. The threading of a needle and even drinking fluid from a full cup may be impossible. The tremor, like the other symptoms, is always increased when the patient is worried or excited. As further evidence of change in the nervous symptoms it may be noted that these patients often have bad dreams at night which are sometimes indeed sufficient to interfere considerably with their sleep. In the nervous type of the disease this group of symptoms is always the most in evidence. These patients may show such nervous irregular movements that they can barely sit still, and the condition comes to resemble closely the movements of chorea, although the more advanced age of the patient —she is usually between 35 and 40—will aid in the diagnosis. Mental changes are also more marked. In the minor degrees the patient is simply abnormally irritable, excitable, and emotional. These changes may be sufficient to interfere with her work, and she finds that they are more marked after a heavy day's work. It is often, indeed, on account of these symptoms that she has to abandon her business. Occasionally the condition may spread even further, and hallucinations may supervene. She then becomes melancholic or even maniacal, and attempts at suicide are not uncommon. In such conditions the patient will often complain of severe headache.

Gastro-intestinal changes are, as a rule, an indication of an exacerbation of the disease. There are periods often at the onset or perhaps arising irregularly at no definite time, and being dependent upon no known cause, when the patient will have severe attacks of vomiting and diarrhœa. At such a time the other symptoms will usually increase. As the exacerbation dies down the vomiting and diarrhœa will cease, and the patient will then develop a good appetite, which, however, at times may be capricious. It is in such periods that she loses considerable weight, and, in a severe case of the disease, wasting, passing on even to profound emaciation, is a constant factor. It has been noted that in some of these periods when the patient has shown diarrhœa and vomiting that there is glycosuria. The relationship of Graves's disease to diabetes has indeed often been noted, and it would seem that even when the hyperthyroidism has been relieved by operative treatment the patient is still prone to develop diabetes. In my series of 139 cases there were two who developed diabetes at periods of one and five years after operation. The relationship of these two diseases has been investigated by Williamson,[36] and he has shown that diabetes may follow the Graves's disease or rarely precede it, or that both diseases may develop together after some mental shock. He has also shown that not only is there often a mild temporary glycosuria in Graves's disease, but, as a rule, the sugar-tolerance is diminished. Occasionally there is a very definite family history of diabetes in patients suffering from Graves's disease.

Changes in menstruation are very common. A large proportion of my younger patients with the vascular type of the disease have had complete amenorrhœa, but this symptom is not constant, for in some of the more advanced conditions the periods have been quite regular and normal. It is usually stated that exophthalmic goitre has no effect either in preventing or altering the course of a pregnancy. This has not, however, been my experience. Some of my cases who have been married for several years and have been childless have become pregnant shortly after an operation. Moreover, it has been my general experience that if a pregnancy has occurred in unoperated cases the symptoms have always been considerably exaggerated, and I have therefore come to regard pregnancy as having a very deleterious effect upon the course of the disease. In those cases who have shown amenorrhœa the return of menstruation is often one of the earliest symptoms of improvement after an operation.

Changes in the blood have frequently been described as characteristic of the disease. As a general rule there is a slight amount of secondary anæmia. Kocher[18] has laid very great stress upon the presence of changes in the differential count of the white corpuscles, and states that there is nearly always an increase in the lymphocytes. Dr. Panton has, however, examined a large number of my cases and has not been able to determine that a change of this sort is in any way characteristic.

TREATMENT.

It is customary to-day to compare the results
medical and surgical treatment and to sum up i
favour of one or the other. It must be remembere
however, that at no time has there been a clos
coöperation between medicine and surgery, and i
no disease is such coöperation so essential as i
exophthalmic goitre. My aim, therefore, will be t
indicate to you how the two methods should b
combined and which variety of case should be treate
with or without surgical measures. It is still perha
necessary to point out that medical treatment alo
cannot be considered satisfactory for the treatme
of all cases. I think this is now becoming unanimous
recognised. Sir Hector Mackenzie some 10 or 1
years ago pointed out that with medical treatme
the mortality was somewhere in the region of 25 p
cent., and that even in those cases which did not d
medical treatment had to be carried out over a cour
of very many years. At that time, however, he di
not advocate surgical intervention, as he regarde
the mortality of operative treatment as much t
high. In his more recent communication[24] his vie
have entirely changed, and he is now one of t
strongest supporters of operative treatment. T
evil results that may accrue in long-neglected cas
I have already mentioned, and you are probab
all familiar with examples of such. Grave myocardi
changes, severe mental disturbances or injury, a
destruction of the eye may all result, and once havi
arisen will usually be beyond recovery even if t
hyperthyroidism is overcome. Since the view
usually accepted that the disease is due to hype
thyroidism the rational form of treatment wou
seem to be the removal of the excess of hypertrophie
gland, but, as I have already pointed out to yo
such a form of treatment must be regarded in its
as unsound. It is only a temporary measure whi
will be abandoned when the cause of the hype
thyroidism is known and can be overcome. The on
serious objection to such a form of treatment to-d
is that of the mortality of the operation. Only a fe
years ago this was extremely high, and there is
doubt that even to-day such an operation is one whi
has to be undertaken with the greatest care. It
always associated with considerable anxiety, for t
causes of a temporary exacerbation of the hype
thyroidism are but little understood. More rece
series of statistics show, however, that extreme
satisfactory results can be obtained. In the discussio
at the Royal Society of Medicine in 1921 it w
agreed that the present mortality averages son
5 per cent. In individual series which have be
published the mortality has been reduced considerab
below this. Romanis[29] published a consecutive seri
of 250 cases with only a 2·4 per cent. mortalit
Pemberton[27] has published the latest group of cas
from the Mayo Institute comprising in all 1093 case
In this group the mortality was 1 per cent. O
may say, therefore, that in this condition the dang
is no greater than that associated with any oth
major operation. The difficulties arise in mo
advanced cases where severe secondary changes ha
taken place, and in hospital statistics a large numb
of such cases will have to be included, for althou
the risk may be well recognised, operation may
the only possibility of holding out any hope
amelioration or cure. It is the inclusion of a lar
number of such advanced cases which has kept t
mortality of my own series at about 5 per cent., a
I believe that if it fell much below this figure it wou
be an indication that I was refusing to offer help
many of those patients which stood most in need of
It must be agreed, therefore, that surgery is not fr
from risk, but that it has a very definite place in t
treatment of this condition, and we have to consid
carefully what are the indications for its use. T
points I would lay stress upon in operative treatme
are :—

(a) *Selection of Time of Operation.*—It is my custo
never to operate in the first six months of the disea

elieve that in this period medical treatment holds t the greatest hope of success. In the early stages symptoms are sometimes very acute and rapid their progress. Not only will an operation in such case be fraught with considerable risk, but the ient will generally react well to medical treatment. e details of such medical treatment it is not my ce to discuss with you, but there is one method ich must be mentioned as much attention has been ected to it of late. This method is that of X ray atment. My own experience of its use has been y unsatisfactory. I have knowledge of three ups of cases in which it has been applied. There firstly those who have come to me seeking further vice but have already had such a form of treatment. nifestly these are selected cases of failure and refore it would be unfair to judge the results of ray treatment upon them alone. In my series of cases there have been 14 such. They have all l prolonged courses of X rays and have gained le or no benefit. A large number of them indeed, you will see from the photographs,* have been y seriously scarred and burnt from the application the rays. Two stated definitely that their sym- ms were much increased after treatment, one of m developed a squamous carcinoma of the skin ich, although removed at the same time as the ration upon the thyroid, later recurred and led the death of the patient. A second group are se who in the earlier series had been treated only h a hemithyroidectomy and who had had some urrence of symptoms with enlargement of the aining portion of the gland. Such conditions uld seem to specially lend themselves to treatment X rays, but of five which have been so treated re has been no relief in any example. Of the ue of this form of treatment in the very early ges where an operation is not indicated my erience is naturally small, but I believe that, if nbined with other methods, it may be of some value. ave no evidence that X rays can overcome hyper- roidism even to the point of myxœdema, as is netimes claimed; but, on the other hand, I have er found that it makes a future operation more icult on account of the fibrosis. If I had evidence t it produced any fibrosis I should believe that it ld control the hyperthyroidism. I have never n it produce any change in the thyroid, but it y cause dangerous and unsightly changes in the n. If at the end of six months the benefit has n very slight, or if the symptoms return as soon he patient ceases medical treatment, then surgical rvention should be considered. Even if opera- has been decided upon, an enormous improve- nt in the immediate results will be gained by a eful selection of the time of operation. It is well ised that all cases of exophthalmic goitre show iods of considerable exacerbation. Sometimes se are most marked in the first six months of the ase, but even later there is always a periodic iation. Mayo has stated that there has been rly always a second relapse at the end of the first r which would usually last about six months, and t such a time was bad for operation. I have not nd in my series that this change is at all constant that every case is liable to bad attacks lasting for rt periods which depend upon no known cause. The safe method of treatment, therefore, is to care- y watch each case and to operate when the sym- ns are minimal. It is well known that any sudden nge of scene or excitement will lead to an exacerba- , and therefore no case must ever be operated n immediately after the patient is admitted to pital or nursing home. They should be carefully ched until it is realised from a study of the pulse temperature, and often of the basal metabolic , that the patient is in the best possible condition the operation to be undertaken. It is during this od that medical treatment is of so much value. In a large number of my more recent cases I have had the great benefit of Dr. C. H. Miller's help. He admits such cases and gives them a course of carefully thought-out medical treatment. If progress is marked operation is delayed, but if, as so often happens, the patient improves considerably and the condition then remains constant, the best time is selected and an operation is performed.

In the late stages of the disease, where there are secondary changes in heart and kidneys, an operation could only be performed with considerable risk, and the mortality is certainly high, but on the other hand, unless an operation be performed, progress will be steadily downhill and the disease itself is likely to be fatal. The increased dangers, therefore, are no counter-indication to operation, but the risk must be carefully explained to the patient's relatives. Although such patients are unlikely to be completely cured, they will often be so enormously improved that they will be converted from bedridden wrecks to those who are able to lead a useful happy life. In spite of all the above precautions there is still an element of uncertainty about this disease, and both Dunhill [11] and Berry [8] have had an experience which is similar to my own—namely, that every operation is carried out with a certain amount of anxiety, for even in those cases which appear to be most suitable an unlooked for result may occasionally occur. This indicates that there is still some factor of which our knowledge is at present imperfect. I[31] have recently laid stress upon the fact that during the very hot weather the symptoms are all exaggerated and the patient stands operation very badly, and that therefore during a heat wave the operation should be postponed.

(*b*) *Selection of the Type of Disease.*—I have already drawn attention to the different types of disease which may be met with, and the importance of recognising them lies chiefly in the fact that the mortality of operation differs considerably in each type. The colloid and nervous types are those who are likely to show the lowest operative mortality, but even with them the precautions mentioned above must be carefully observed. The nervous type of patient stands an operation badly, so that a rather more prolonged preliminary treatment may be necessary. Should there have been a history of mania or of attempts at suicide the outlook is even more serious, and for this reason many physicians and surgeons advise that the presence of such symptoms should be regarded as definite counter-indications to operation. It should certainly never be considered until medical treatment has been tried, but I have one case in my series who on three occasions had attempted suicide but after operation enormously improved and is now living a normal and happy life. An operation under such conditions must only be undertaken after the risks have been carefully considered and explained to the relatives.

(*c*) *Preparation for Operation.*—The importance of a thorough course of preliminary medical treatment has already been mentioned. It should under no circumstances be omitted. The administration of large saline injections as a means of lessening the toxæmia is of considerable value and may be very useful as a preparation for the anæsthetic. In the choice of anæsthetic there has been much discussion. Many surgeons lay great stress upon the importance of a local anæsthetic. It has been my custom, however, to use a minimum amount of ether, as I believe that if this anæsthetic is carefully given it is practically free from risk and it overcomes the drawback of the psychical disturbance which is often so evident in these patients when they are conscious. My own method is to administer for several days before the operation a rectal saline. On the day of operation the rectal saline is changed for a mixture of olive oil and ether, 3 oz. of each being used. This is administered about three-quarters of an hour before the operation and is usually sufficient to cause unconsciousness, so that the patient can be carried to the theatre without her knowledge. The actual anæsthetic is continued with ether on an open mask, but as a rule only about 1-1½ oz. is required. Chloroform in any form must never be used; it appears to act as a deadly poison.

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* Many photographs of cases before and after operation were n at the lecture.

(*d*) *Choice of Operation.*—Many forms of operative technique have been carried out. In some advanced cases a preliminary ligature of the vessels of one or other pole—and my own belief is that ligature of the upper pole is a much simpler and less serious operation—is of value in reducing the toxæmia. If, however, a careful course of medical treatment has been carried out this preliminary operation will be required very seldom. There is no doubt that at the operation itself the two chief dangers are dependent upon pressure upon the gland and upon hæmorrhage. Owing to these dangers the operation must be slowly and carefully performed. Every vessel should be carefully ligatured before it is divided, and any attempt at a wedge-resection should be abandoned. It will generally necessitate considerable pressure upon the gland, a much more severe hæmorrhage and rather rougher handling in order to control the bleeding.

(*e*) *Operative Technique.*—Free access to the gland is obtained by means of a collar incision, and for the same reason the pretracheal muscles should preferably be divided. The individual vessels are isolated in turn and divided between ligatures. The number of vessels to be tied and the amount of thyroid to be removed will of necessity vary with the severity of the case, and if the symptoms are very marked it may be necessary to be content with a small resection, and later, when the patient has improved, to carry out a further operation. My aim in suitable cases is to ligature and divide the superior vessels, the middle and inferior thyroid vein in the right side; to ligature and divide the left inferior thyroid vein, and to ligature the left superior thyroid vessels. These steps are accomplished in turn; the right lobe is then turned inwards, and the inferior thyroid artery ligatured in continuity as it lies on the longus colli muscle. The right lobe, except for a small slice on its posterior surface, is then removed together with the isthmus and the inferior and the internal portions of the left lobe. There is thus left the upper and middle portion of the left lobe, the superior vessels of which have been tied, and which is, therefore, supplied by the inferior thyroid artery and drained by the middle thyroid vein. After all bleeding has been controlled a tube is inserted and the pretracheal muscles are closed. The skin is sutured with silkworm gut.

(*f*) *After-treatment.*—After every operation upon the thyroid gland there will be a period of reaction, probably due to hyperthyroidism, and in this period danger arises. In fatal cases the patient will get more and more restless, the temperature and pulse will rapidly rise, sweating will be increased, and there will often be a condition of slight mania. In satisfactory cases the temperature may rise to 102° and the pulse to 140 or 160. As long as there is any such evidence of reaction the tube should be kept in place. Morphia should be given freely to overcome restlessness, and large quantities of fluid administered both by mouth and per rectum. The patient should be kept in bed for at least three weeks after operation, and after leaving hospital should be given strict rules as regards her life and diet. All form of excitement and stimulants should be avoided. The patient should live as much as possible in the fresh air, and a plain, simple diet with a relatively small amount of meat should be advocated.

Post-Operative Results.

It has been mentioned that in my own series the mortality has been 5 per cent. This probably could have been reduced, for in some of the earlier cases the operation was performed at what is now realised to be an unsuitable time. Until, however, these cases come up for treatment earlier in their disease, and until operation is sought before there are advanced secondary changes, there will still be an appreciab mortality. Of the cases that survived operation fi have died later; one of these was from the recurren of X ray carcinoma, two had developed diabetes, ar two had succumbed with cardiac symptoms due hyperthyroidism. Of the remaining 129 cases, per cent. have been changed from disabled wrec into people who are capable of living normal lives ar of earning their living. In these, it is true, some st show exophthalmos, and have a pulse-rate which likely to be increased upon excitement and exertio but they are nevertheless able to live normal and hap lives. It must be remembered, too, that exophthalm although it will ultimately disappear entirely, m persist for a very long period, even when all oth symptoms have disappeared. It should also explained to the patients that after such an operati there is no immediate cure such as occurs with many other surgical lesions, and the following stag can be recognised in every case:—

(1) *Stage of Reaction.*—This lasts for three to fo days after operation, and the symptoms are those hyperthyroidism.

(2) *Primary Improvement.*—When the patient leav hospital it is often found that the pulse has fallen normal, that the tremor has almost disappeared, ar that there has been a remarkable and startli improvement. It will persist, as a rule, for two three weeks.

(3) *Stage of Relapse.*—Whatever rules are given the patients, it will usually be found that after th have returned home there is a certain return of the symptoms, and unless this relapse is appreciated will be found to cause considerable disappointme As a general rule it would last for only two to fo months, but if the case is less satisfactory, or if insu cient thyroid have been removed, it may be prolong very considerably, and, in fact, until a further porti of the enlarged thyroid is removed.

(4) *The Stage of Apparent Cure.*—It is only wh cases have been watched very carefully for a prolong period that it is realised that after operation th will show a complete freedom from all symptoms, b should there be any severe mental upset or disturban the symptoms may recur. I have had experience several such cases, apparently absolutely cured, w having been subjected to the disturbance and fear an air raid, have had their symptoms return to minor degree. As a general rule a short course medical treatment was sufficient to overcome the symptoms. This period of instability would appe to last for some two to four years.

(5) *Stage of Complete Cure.*—This is the conditi in which the patient is not only completely free fr all symptoms, but can apparently be subjected all normal shocks and disturbance without fear recurrence.

There is a general fear, since some cases show regression of the changes in the thyroid when und medical treatment, that similar changes might occ after operation, and since a relatively small porti of thyroid is left therefore myxœdema would resu I have no experience of any such complication. my own series of true exophthalmic goitre there h never been any myxœdema after operation. Koche has had a similar experience, and it would seem that the few cases reported the myxœdema appeared ve shortly after operation, and was due to removal of t large a portion of the gland. I believe, therefore, th this danger is greatly exaggerated.

It will be evident to you that in the treatment o very large number of the different forms of goitre have advocated the use of medical measures. I fe however, that no apology is needed for discussing subject which is so largely medical, for the first less that you as surgeons have to learn is what cases shou be so treated. If I have been able to indicate to y when not to operate as well as when to operate lesions of the thyroid gland, I shall feel that I have n taken up your time in vain.

(*Continued at foot of next page.*)

THE ÆTIOLOGY OF KALA-AZAR AND TROPICAL SORE.

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THE theory which associated kala-azar with the bed bug, and which promised well in the initial experiments carried out by Patton[1] does not, up to the present, appear to have yielded definite results; the position with regard to other insect vectors incriminated in this disease and in tropical sore is also unsatisfactory. The fact that the common bed bug has a very wide distribution has been adduced with reason against the theory that it would prove to be the vector of a disease of such circumscribed distribution as kala-azar. In investigating these diseases, attention has been given to the flagellates which commonly infest various plant bugs, but these have been exonerated on account of the fact that the bugs do not bite man. An observation which I recently made in Sierra Leone may possibly serve to focus attention again on plant-feeding bugs.

Since Lafont's[2] discovery of the occurrence of flagellates of the genus Herpetomonas in plant juices—the latex of Euphorbia—more attention has been given to the flagellates which infect plant bugs, as well as to the natural flagellates of other insects. Laveran and Franchini[3] recorded their success in producing Leishmania forms of parasite in mice by injecting them with flagellates from insects; Fantham and Porter[4] and other observers have repeated and confirmed their experiments. Recently Roubaud and Franchini[5] obtained in mice infection with Leishmania forms of parasite by allowing fleas having a natural infection to breed in their box. The infection, which proves fatal to the mice, was conveyed to fresh mice by means of subcutaneous injection of ground-up tissues. These workers also obtained a similar result in mice by injecting into them the fæces of fleas.

Flagellate Infection among Plant Bugs.

The occurrence among plant bugs of flagellate infection has been emphasised by Patton[6], who described *Herpetomonas lygæi* and other such bug flagellates. Evidence is also available of the ability of the flagellates to infect the bugs, not only in the alimentary canal, but also in the salivary glands. Franchini[7] reports that he has cultivated flagellates *Herpetomonas pyrrhocoridis* from the alimentary canal and salivary glands of *Pyrrhocoris apterus*. Miss Robertson,[8] in Uganda, found the alimentary canal of the red cotton bug infected; she also found that another species of bug, *Leptoglossus membranaceus*, was commonly infected with Herpetomonas in the salivary glands. She refers with emphasis to "the independent development in a sucking insect of all the factors requisite for the transmission of a flagellate, parasitic in the intestine, by way of the mouth parts of the insect host."

Experiments of great interest were carried out by Franchini[9] in cultivating in media containing plant juice various natural flagellates of insects. He showed not only that such flagellates will develop readily in certain of these media, but also—what is of especial interest—that the parasite of tropical sore will grow in a medium containing certain plant juices. There is thus established a connexion biologically between a human parasite and the insect flagellate and plant juice, which I venture to think is not without significance. If we find that bugs, which as a rule live on plant juice and which are capable of harbouring flagellates in their gut and in their salivary glands, are able to bite man, it would be a strong argument for the thorough investigation of the habits and bionomics of such forms before their dismissal from consideration in connexion with kala-azar and tropical sore.

Do Plant Bugs Bite Man?

I desire here to draw attention to the fact that a cotton stainer, which is apparently restricted very closely to certain species of food plant, is capable of biting man. The species* of bug is *Dysdercus superstitiosus*, which at first, as the result of several experiments made by me in the laboratory, I concluded could not bite man. This year at Freetown I was bitten by this bug on the ankle on two occasions, April 24th and 26th, while sitting out of doors at dusk, and after many attempts was successful in getting one to bite experimentally. On each occasion there was a local reaction in the form of an irritating swelling, and on the third occasion this was followed by extensive swelling of the leg, with considerable œdema and great itching. There was no general reaction, no rise of temperature, no enlarged glands; no parasites were found in the blood, but there was great eosinophilia. This species of bug has been observed by me to feed in nature on the carcass of a dead frog. A near ally, *D. fasciatus*, has been recorded by Mansfield Aders[10] as feeding with avidity on fresh mammalian carcasses, skins, and skulls. Lamborn[11] says that during the dry season *D. superstitiosus* appeared to thrive on almost any

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* Mr. Lang, of the British Museum, kindly identified the species for me.

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food of animal or vegetable origin, for eight or ten were noticed feeding on a dead and sun-dried lizard, and a batch of young nymphs were found on sheep's excreta. Peacock[12] gives an observation of young stainers of the same species feeding on a dead snail. The habits as regards food plants of these bugs confine them chiefly to cotton, the silk cotton tree, okra, and other Malvaceæ. While the obvious adaptability of such bugs makes it appear possible that in some districts they have acquired even greater readiness in biting man in nature, there is also the fact that they are in most cases very restricted either to certain areas or to certain food plants. On dissection of specimens of *Dysdercus superstitiosus*, I found that they were heavily infected in various portions of the alimentary canal with a Herpetomonas ; this was also found in one case in cœlomic fluid.

I believe these observations to be worthy of record, although owing to their having taken place only a few days before my leaving Freetown, they are necessarily far from complete. In view of the present state of the kala-azar problem, I consider that they indicate the necessity of an investigation of all such forms, not only in countries where kala-azar abounds, but also in countries where tropical sore occurs.

Note.—In a letter received, since this article was written, from Dr. Maplestone at Freetown, he informs me that he has discovered infection of the salivary glands.

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KÖHLER'S DISEASE OF THE TARSAL SCAPHOID.

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Since Köhler showed his first three cases of this disease at Wiesbaden in 1908 and published an account of them,[1] the number of examples placed on record is inconsiderable. In 1915, when he reviewed the subject, there were only 26 ; since that time additional cases have been described by Maynard Heath,[2] O'Brien,[3] Hetzel,[4] Moreau,[5] Roederer,[6] Beltrandi,[7] but the disease must still be considered to be comparatively rare. The symptoms and physical signs are not obtrusive, spontaneous recovery seems to be the rule, and the precise diagnosis rests on the characteristic X ray appearances ; it is probable, therefore, that the disease often escapes detection and that it is more common than the records indicate. The clinical picture is fairly clear-cut, although in details there are some differences of opinion.

Clinical Picture.

The disease occurs in young children, more frequently in boys, between the ages of 3 and 10 years. The onset is usually insidious, sometimes sudden,[8] with pain and swelling in the region of the tarsal scaphoid. Whilst it is generally unilateral, both feet are sometimes affected. The general health is usually indifferently good. The child develops a limp and shows more or less tendency to flat-foot. Spontaneous recovery always occurs, so far as present records show, in from 6 to 12 months from the date of diagnosis. The ultimate diagnosis rests on the X ray findings. On these, but not on their general interpretation, there seems to be general agreement. They are as follows.

(1) The affected bone is smaller than normal (half to quarter size) ; (2) the outline of the bone is irregular (Köhler omits to mention this fact) ; (3) the density of the bone is increased (estimated at two to four times) ; (4) the normal architecture of the bony trabeculæ has disappeared. To these may be added (5) the general shape of the scaphoid is altered, being more flattened from before back and not widened from side to side.

Ætiology.

When we consider the ætiology we find considerable diversity of opinion ; the attempt to find analogues in Madelung's deformity of the wrist-joint, in Perthes's disease, in Schlätter's disease of the tibial tubercle, would be more helpful if the ætiology of these affections were less speculative. Kidner's report of a case of Perthes's disease, in which at an operation " a *Staphylococcus aureus* from a blood-stream infection " was found, is suggestive, but lacks confirmation. All authorities exclude rickets and syphilis as causative factors ; most writers reject tuberculosis on grounds that appear inconclusive. Abrahamsen [illegible] strengthens the view that the disease is a simple " dystrophy " by citing the case of a boy aged 7 years, who without any (known) antecedent injury developed weakness of the right ankle. A skiagram showed that there was little or no sign of ossification present in the right scaphoid, although this process normally begins in the fourth year. In the left foot ossification was normal. After nearly three months' administration of thyroid extract a skiagram revealed typical Köhler's disease of the right tarsal scaphoid with a narrow, compressed, and dense centre of ossification.

Köhler himself shares this view, which receives confirmation from the fact that the disease may be bilateral (Köhler, 10 cases out of 26) and unassociated with any history of trauma. He also found a similar condition in the patella of the same side in one case. Rotch[10] found the twin brother of one case with similar X ray evidence in the scaphoid, but with no symptoms. The argument that the disease is a dystrophy is materially weakened, however, by Köhler's assertion that relapse sometimes occurs. Incidentally, his estimate of the duration of the disease at 2–3 years is shown by later observers to be too prolonged—in Maynard Heath's case,[11] as in mine, the bone had returned to an almost normal appearance in six months. Stümme[12] ascribes the disease to a compression fracture, and Preiser[13] supports his view by comparing it to a fracture of the carpal scaphoid. O'Brien[14] invokes a delay in ossification, stimulated by trauma to osteogenesis. Schultze[15] obtained a definite history of injury in six out of seven cases. Pfahler[16] dismisses injury on the ground of there being in many cases no history of such a cause and of the onset being often gradual. The latter assertion is generally conceded, and any injury is often so trivial that none can be recalled, but gradual onset and trivial injury as a provocative cause of tuberculous disease in the subject of a latent infection suggest more serious consideration of the view of Fassett,[17] who, so long ago as 1914, advanced the explanation that the lesion is a healed and sclerosed tuberculous infection.

The Question of Tuberculosis.

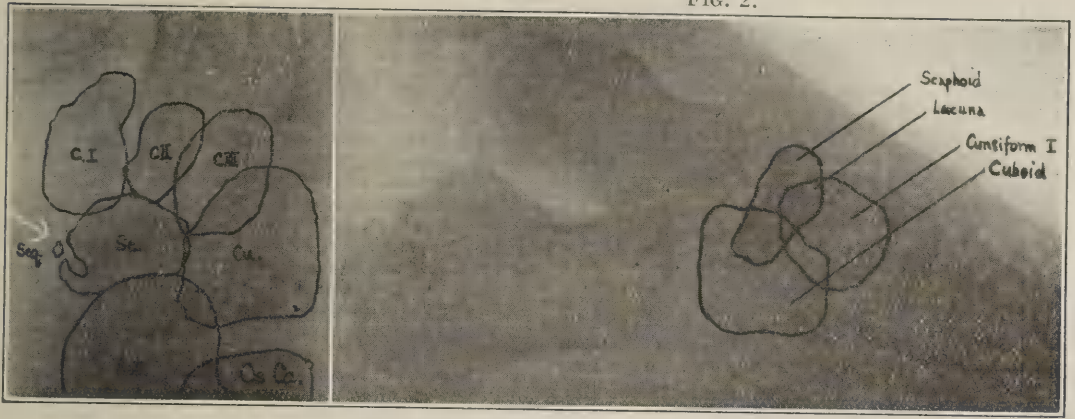
Although most authorities demur on account of the clinical course of the disease, and Hetzel[18] found the von Pirquet reaction negative, the new evidence I shall detail warrants a review of the clinical data and X ray appearances, none of which is incompatible with this theory. Dogmatic statements only serve to darken the night of our doubts, and should not be allowed to carry conviction.

Roederer,[19] reviewing the subject in 1920, asserts confidently that " les deux sexes sont indifférement atteints." (Maynard Heath declares that the condition is *always* found in *boys* between 3 and 9 years.) Again, he says, " aucun de ces enfants n'est tuberculeux." And later he states " deux fois seulement l'enfant appartient à une famille tuberculeuse (Köhler 1, Schultze 1)." As to the positive grounds upon which the assertion that all the patients were free from tuberculosis is based, there is no evidence. Parental berculous infection plays a more conspicuous part in e recorded cases than Roederer admits; in Maynard eath's case the father was tuberculous.

Let me quote from the excellent description of a se recorded by Dr. Giovanni Beltrandi.[20]

Boy, aged 6½ years, of healthy parents. The mother states at about two years prior to admission to the hospital the y had a fall, hurting his foot, with the result that he was me for some time; occasionally, at long intervals, he mplained of pain in the left foot, lasting for about an ur. Nothing untoward could be established until, two eks before, she noticed that the foot was swollen, while e pain was more severe than usual. On examination, on e dorsal and internal aspect of the left foot an irregular otuberance was observed, extending from the tibio-tarsal e to the metatarsic tarsus. The skin over this protuberance esents a very marked venous network. The circumference the left foot, measured over the protuberance, exceeds by cm. that of the right foot. The swelling is sensitive to essure, and all active movements of the foot are reduced.

FIG. 1. FIG. 2.



Right tarsus, (1) from above; (2) external aspect. Seq. = sequestrum; C.I, II, II = internal, middle, and external cuneiform bones: Sc. = scaphoid; Cu. = cubiod; Ast. = astragalus; Os Ca. = os calcis,

X ray examination of the foot showed that the scaphoid ne was reduced in volume to one quarter of the normal e. It also appeared to be divided into two parts; in the aller of the two the cortical and spongy substances show line of demarcation, and the pronounced shadow points the fact that there is a marked increase in the content of calcium salts in the scaphoid. In the larger portion the sence of any osseous organisation was also apparent. e scaphoid of the right foot also exhibited the same picture, not in so pronounced a degree.

A Case of the Author's.

In the following case the chief features will be found be similar.

male child, aged 5 10/12 years, was active but had ays been delicate. His mother was delicate and his father suffered for years from definite pulmonary tuberculosis. out Dec. 10th, 1919, the boy sustained an injury to his ht foot. Soon afterwards he fell ill with chicken-pox. ring convalescence he complained of pain in the right t, and on attempting to walk displayed a well-rked limp.

ondition on Examination.—Early in February, 1920, he referred to me. He was at that time pale and frail-king, but alert and intelligent. He limped obviously on right foot, which showed a swelling over the region of scaphoid bone, most marked on the dorsum of the foot. skin over the swelling was thin and smooth with increase the venous network. Pressure on the swelling caused n, but no œdema was present. Movements at the tarsal joint were limited.

Ray Findings.—A tentative diagnosis of early tuberculous ase of the tarsus was made and skiagrams taken. These wed all the stigmata of Köhler's disease. In Figs. 1 and 2 scaphoid bone of the right foot is seen to be smaller than mal, narrowed antero-posteriorly, irregular in outline, density of the bone much increased, and the normal hitecture blurred. In Fig. 1, however, there is a new ture, not observed in the record of any previous case—nely, a tiny sequestrum (indicated by an arrow) no larger n a millet seed, lying in the soft tissues, supero-internal the scaphoid. In the latter bone there is a deep hollow ch larger than the sequestrum, and from which the latter evidently been discharged. In the photographs taken five months later (July) the hollow had become a cleft, with the opening on the surface of the bone showing [illegible] mere dimple; the density of the bone has become less marked, and there was an increase in the thickness of the bone. In October another photograph revealed a scaphoid almost normal in shape and density, and in which the natural architecture of the bone is reappearing.

Course of Case.—The possibility of fracture was considered and rejected—the appearances were plainly those of a caries. Examination did not reveal any signs of a developed tuberculous lesion in any other part of the body, but, considering his environment (his father definitely tuberculous, his mother probably also affected), it is not surprising that the boy has since developed undoubted pulmonary tuberculosis.

The alleged injury occurred in December, 1919, and the first skiagram was taken early in February, 1920, after which the foot was fixed in plaster-of-Paris. Open-air treatment was carried out, and the foot kept at rest by re-applications of plaster until September, 1920; the arch of the foot was then found to be weakened; there was a slight degree of flat-foot but no thickening of the scaphoid, or around it, could be made out. By the aid of massage, exercises, rest, and raising of the inner side of the sole of his right boot, complete functional recovery followed by the end of the year.

Remarks.

In reviewing the cases recorded in the literature it is certain that no real causa causans emerges from a theory of "dystrophy" or "delay in ossification" later "stimulated to osteogenesis by trauma." Indeed, a history of trauma could probably be obtained in every case from parents of average intelligence and memory, by careful and persistent investigation, especially if the period inquired into is allowed to stretch as far back as two years before the detection of the disease, and to include injury of any degree of severity.

The conception of the disease awakened by the case I have described is that in a child the subject of a latent mild tuberculous infection there is lighted up (possibly by an injury of moderate severity) a smouldering tuberculosis of the scaphoid bone of the foot, the bone which, being the keystone of the arch, is most subject to strains, stresses, and blows. The early stage, evidenced by a rarefying osteitis, gives rise to such trifling clinical signs that no complaint is made, no X ray examination carried out (unless it be done fortuitously as in Abrahamsen's case[20]), and the disease escapes recognition. Should the disease progress and spread to neighbouring bones the case is diagnosed as a frank tuberculosis of the tarsal bones. But should resolution occur and a reparative sclerosis take place, either no diagnosis other than "sprain" or incipient flat-foot is made, or an X ray examination is made, and the condition found is called Köhler's disease. It is natural then that recovery should "always occur" since the disease is already recovering when detected.

My case is a border-line case, in which actual necrosis to a very limited extent had occurred, but in which the battle had really been won, and which had become, five months after the first observation, a typical case of ordinary Köhler's disease. In every case hitherto recorded the pathology has been deduced from probabilities. This appears to be the first instance of a definite linking-up of the condition with a known disease.

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SYMPHYSIOTOMY, CRANIOTOMY, AND CÆSAREAN SECTION.*

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A study of the case records in the Dundee Royal Infirmary Maternity Department from 1901 to the end of 1922 has brought various points of interest into view.

Symphysiotomy.

During the period 1901 to 1922 symphysiotomy was performed 12 times. The usual indication was contracted pelvis. It may be taken for granted that no one would have recourse to this operation without first having given forceps a fair trial, not to mention Walcher's position, at least in many cases. In one case in this series a brow presentation was given as the indication. Obviously symphysiotomy is of no avail except in mild degrees of disparity between fœtal head and pelvic brim.

The increase in measurement available with an interval between the pubic bones of 6 cm. ($2\frac{2}{5}$ in.) is not very great at the brim, but is of considerably more value, according to Munro Kerr, at the outlet between the ischial tuberosities. The estimated increase at the brim with a separation of 6 cm. is as follows: Antero-posterior diameter, 1 cm. ($\frac{2}{5}$ in.); oblique diameter, 1·5 cm. ($\frac{3}{5}$ in.); transverse diameter, 2 cm. ($\frac{4}{5}$ in.).

Dangers of Symphysiotomy.

The operation is not to be undertaken lightly, for it has its dangers. There is quite a definite maternal death-rate and, apart from loss of life, there are various morbid conditions which may affect the mother. The chief danger is sepsis, and this may go so far as to cause sloughing of part at least of the vaginal wall. Cystitis may also develop, and one must not forget the possibility of injury to the sacro-iliac joints. There is also a fœtal mortality associated with this procedure. It is possible that this might be somewhat reduced if the need for symphysiotomy were recognised sufficiently early, for, no doubt, too strenuous efforts to extract the child with forceps may in many cases turn the scale in the wrong direction and lead to the death of the child.

Symphysiotomy is an operation of limited value and should only be performed under good conditions and if proper after-care is available.

Craniotomy.

With increased antenatal care one would hav expected a distinct drop in the number of craniotom cases, but in the period specified the largest numbe was done in 1921. It is important that antenata care should extend to all private patients as well a to hospital ones. If the private case develops int an emergency (in the private house), the chance of happy issue is less than in the case of a hospita patient unless, as is only occasionally the case, th patient can be removed to a nursing home. As rule, by the time the emergency has arisen, it woul be inadvisable to remove the patient. So the bes thing must be done under inconvenient circumstance and that may mean craniotomy.

In every private and hospital case the ideal is tha the pelvic measurements should be known we beforehand, as also the position and presentation the child, the relation in size of the presenting pa to the pelvic brim, and the state of the urine. this were done as a routine, and if preventive measur were carried out, there would be fewer bad results t both mother and child. Craniotomy is, at best, revolting operation, especially if carried out on th living child. Any operation involving a death-rat of 100 per cent. to the child cannot be an ideal an can only be recommended as the best thing to d under bad circumstances.

At the end of 1922 there was a leading article i The Lancet on Justifiable Fœticide,[1] which wa commented on by (presumably) a Roman Catholi doctor[2]; what the latter said is worth recording, f no doubt most medical men are aware that th destruction of the living child in utero is strictl against the dictates of the Roman Catholic Churc I quote from the doctor's letter: "The teaching the Church with regard to craniotomy is quite clea and definite, it is not permissible under any circum stances." Then there is the order given in Lati He goes on: "This decision was given at Rom August 19th, 1888, and repeated with the pap approbation on July 24th, 1895."

That is all very well, and I do not wish to start controversial argument here on this decision. Bu what I wish to point out is that apparently th authorities of the Roman Catholic Church do n recognise that in allowing the mother to die b neglect of a craniotomy they are still not saving th child, for a dead mother, in these circumstance would mean a dead unborn child. There would th be the certainty of two deaths as against one. Althoug most of us, no doubt, do not agree with a strict ord against craniotomy on the living child, yet we mu all be at one in holding that such a procedure shoul be avoided if it is at all possible and consonant wit the safety of the mother.

There are substitutes—namely, induction of labo and Cæsarean section, not to mention symphysiotom or pubiotomy—under certain circumstances. Prop antenatal care will give the best chance for callin these substitutes into play. Of the cases of cran otomy in this series by far the commonest indicatio was contracted pelvis. There were three cases which hydrocephalus was the indication, and in few cases the operation was performed for vario other conditions. In three of the cases the afte coming head was perforated. From a study of th case-sheets it would appear that nearly all, if n actually all, of the children were already dead befo craniotomy was done, forceps having been found t be ineffectual.

This series shows that there is a real danger death or of morbidity to the mothers. With muc interference there is a particular liability to sept invasion and the patient, too, may become worn o and collapsed. In two cases rupture of the uterus reported.

Perhaps the three chief morbid results, apart fro death, which may follow craniotomy are: 1. Seps from much interference, involving the uterine cavit

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* Based on a paper read before the Forfarshire Medical Association, in which the actual statistics were given.

[1] The Lancet, 1922, ii., 1182.

[2] Ibid., 1358.

. Septic infection of tears, chiefly of the vagina, due o laceration by sharp pieces of the broken-up fœtal kull. 3. Fistulæ—vesico-vaginal or recto-vaginal—robably from injury with subsequent ulceration hrough to bladder or rectum, rather than from direct aceration right through to one or other cavity at he time of extraction.

CÆSAREAN SECTION.

The cases of Cæsarean section, as would be expected, ave increased in numbers as the years have gone by, he greatest number being recorded in 1922. It is o be expected that the yearly number of these cases vill increase, within limits, for some time to come, ainly because of increasing antenatal care and nticipation of troublesome complications. On the ther hand, it is quite reasonable to suggest that cases f Cæsarean section may be limited in number by nduction of premature labour in selected cases. But Iunro Kerr would seem not to agree with such a tatement, for he says: "Induction of labour does not ome into competition with Cæsarean section, for ery rarely are the results from induction satisfactory the conjugata vera is under 3¼ inches."

One might say that in the mother's interests, in ases of contracted pelvis of varying degree, and if orceps are not likely to avail, induction is the proedure of choice, Cæsarean section the best thing to o if induction is contra-indicated, and craniotomy an nfortunate necessity, as applied to the living child, hen other and better means are not available. In few cases symphysiotomy or pubiotomy may be onsidered. Nevertheless, much may be done by iving plenty of time during labour, combined with Valcher's position in cases of mildly contracted elvis, taking for granted that presentation and osition are normal. It is well in those slow cases to nploy twilight sleep.

Cæsarean section, being a comparatively easy and omewhat spectacular operation, is apt to be abused nd employed unnecessarily.

Of the patients in this series—representing 57 perations—30 were primiparæ and 27 were multiparæ. he patients actually numbered 50, as two were perated on three times and three were operated on vice. In addition, one patient had her second æsarean section performed in the Dundee Royal nfirmary, the first having been done in America.

Cæsarean section is not without its dangers to the others, and certain morbid sequelæ, or even death, ay result. This must be taken into account in eciding between this and some other procedure. lso there is quite a definite fœtal mortality, so that a few instances the objective may be at least partly st on this account. A few cases may be recorded y way of indicating the worth of the operation when operly applied:—

CASE 1.—First child, premature, died in 29 hours; second ild, symphysiotomy, died; third child, Cæsarean section, ive and mature.

CASE 2.—Three children, craniotomy each time; fourth ild, Cæsarean section, alive and mature.

CASE 3.—First and second children, instruments, stillborn; ird child, Cæsarean section, alive and mature.

CASE 4.—First child, instruments, stillborn; second child, esarean section, stillborn; third child, Cæsarean section, ve and mature; fourth child, Cæsarean section, alive and ature.

The indications in the present series (totalling 57) ere:—

Contracted pelvis	51
Contracted pelvis and malposition ..	1
Carcinoma of rectum	1
Placenta prævia	2
Reason not stated	2

As the operation results have improved, so have e indications increased, but discrimination and rbearance are required lest it be undertaken rashly d without necessity. For there are not only mediate dangers, but late ones, such as rupture of e uterine scar at a subsequent pregnancy.

Indications.

1. *Contracted pelvis.*—This is the commonest indication. This may be actual or relative, for a postmature child passing through a normal pelvis will create the same problem as an ordinarily mature child passing through a narrow pelvis. Pelvic measurements taken in advance are of great value, but, as it is said, the best pelvimeter is the fœtal head. The relationship can usually be fairly accurately estimated by abdominal or bimanual palpation. Thus a decision may be come to either for or against the operation in any given case. Roughly speaking, a conjugata vera of 3¼ inches or less is likely to lead one to consider the advisability of performing Cæsarean section, unless the child is very small.

If the child be dead, craniotomy would be the operation of choice, unless the pelvic contraction or deformity is too great for that to be justified.

2. *Tumours.*—These are chiefly fibroids and ovarian tumours. As pregnancy advances, or in the early stages of labour, the tumour may rise out of the pelvis and thus cease to be a cause of obstruction. If it remains in the pelvis Cæsarean section is indicated, for it is dangerous to both mother and child to try to drag the child past the obstruction. A thin-walled cyst might rupture during the process and thus remove the trouble. Under proper circumstances it may be deemed wise to remove a tumour, when recognised, during pregnancy, deliberately running the risk of inducing premature labour by such interference. More often it would be indicated to do a Cæsarean section at term and deal with the tumour at the same time. Other tumours need not be specified.

3. *Eclampsia.*—The indication for Cæsarean section in this condition is not very great. The child is often dead in any case, and the results to the mother do not greatly encourage recourse to this method of treatment. Success might possibly be more frequently ascribed to Cæsarean section if it were carried out in the early stages of the eclampsia. At the British Congress of Obstetrics and Gynæcology held in Liverpool in June, 1922, Cæsarean section did not take a very high place in the treatment of eclampsia. The cases were divided into mild (M.) and severe (S.).

Maternal mortality.	London.		Midland.		Aggregate.	
	M.	S.	M.	S.	M.	S.
(*a*) Natural delivery ..	6·0	20·5	3·6	44·0	4·5	36·9
(*b*) Assisted delivery ..	5·0	33·3	8·0	29·4	5·5	31·7
(*c*) Induction	5·1	20·8	11·7	40·0	6·6	26·4
(*d*) Cæsarean section ..	9·8	43·2	50·0	75·0	11·3	46·3
(*e*) Accouchement forcé ..	25·0	60·0	14·3	66·0	18·1	63·1

Cæsarean section may be required in cases of eclampsia for some other reason, quite apart from the eclampsia itself—e.g., contracted pelvis.

4. *Placenta Prævia.*—Lawson Tait recommended Cæsarean section for this condition in 1898. In selected cases this may be the operation of choice, under suitable conditions, as one would not expect the maternal death-rate to be raised, and certainly the fœtal death-rate should be lowered very considerably. But one would deem it wise to operate very early in labour, or just before its onset, before the placental circulation has become seriously embarrassed or cut off, and before much vaginal examining has been done, involving the greater risk of sepsis. It would seem unwise to advocate the operation in merely marginal cases and also in cases in which there has been so much bleeding with, presumably, wide separation of the placenta, that the child must almost certainly be dead.

5. *Accidental Hæmorrhage.*—Cæsarean section would rarely if ever be done for this complication in mild cases, and in severe cases the child would usually be dead. Hence the indication would be to save the mother, if it is considered that bleeding is still going on to a dangerous extent, and if she cannot be delivered quickly enough in the normal way, or if it is considered that she might stand Cæsarean section

but would very likely succumb to the prolonged strain of labour.

Other Indications.—Other possible indications, which may be briefly dismissed, are as follows :—

(*a*) A uterus which has had one or other fixation operation performed on it which will limit its power of expansion in the proper form and is thus in danger of rupturing or of becoming impacted.

(*b*) The operation might be justifiable in a very few cases of prolapse of the cord if the child were still actively alive and if the cord could not be retained in the uterus.

(*c*) It might be done occasionally in certain cases of malpresentation or malformation of the fœtus, and in certain cases of abnormality of the maternal passages—e.g., retraction ring, rigid os, bone tumour, and so forth.

(*d*) Some diseases might also be considered as indications for the operation, such as certain forms of cardiac disease.

In the present series there were eight re-operation cases. In one of these (third Cæsarean section) the uterine wall was said to be thin from old scars, and in another case (second Cæsarean section) the lower part of the old scar was found to have given way after the placenta had been removed. It is no uncommon experience, however, to be unable to find a previous scar at the time of a subsequent operation.

Eardley Holland gives the frequency of rupture of Cæsarean section scars in subsequent pregnancies as 4 per cent., the cause being imperfect healing leading to a thin scar which stretches during pregnancy and ruptures on account of increased intra-uterine pressure either during pregnancy or during labour, or, it may be, from an accidental cause.

The chief cause of imperfect healing is, no doubt, infection and possibly the suture material may have something to do with it. Holland seems to be against catgut as a suture material, stating that there is two-and-a-half times the liability to rupture subsequently if it has been employed. He rather favours silkworm gut, although this is a material which, for other purposes, is rarely if ever employed for buried sutures. Any kind of suture material—catgut, silk, silkworm gut—may give excellent results if sepsis is avoided and if the whole thickness of the uterine wall is brought into accurate apposition.

Of the 57 cases, 52 were in labour, 1 was not, and in 4 cases this point was not indicated. One advantage of the patient being in labour when the operation is carried out is that drainage downwards may be more effective, as the os will be definitely open. Also it more or less ensures, as nearly as can be, the full maturity of the child. It is said that the uterus will contract better afterwards if labour is in progress, but the stimulus of the operative interference is quite sufficient for this purpose in the case of a normal uterus. It has been suggested, too, that in primiparæ there may be more tendency to trouble from after-pains, if the operation has been performed before the onset of labour, on account of the retention of discharges in the cavity of the uterus.

But a possible disadvantage in waiting till labour comes on is that arrangements may have to be made in a hurry and results may be prejudiced where such an emergency arises in private practice, necessitating transport to a nursing home at a time when the patient is not very fit for it. It is probably better in a private case, if Cæsarean section has been decided on, to do it at a given date, as nearly as possible just before labour is due to start, or to have the patient in a home in good time and let her wait till labour has just started before operating. It must not be forgotten that there is a distinct danger of sepsis with tragic results if a Cæsarean section is done on a patient who has been much examined or on whom attempts at delivery per vaginam have been unsuccessfully made. Many operators would rather do a craniotomy under such circumstances. The maternal death-rate in Cæsarean section is by no means negligible, death being due to such causes as sepsis and pulmonary embolism.

Sterilisation of patients is a matter for judgmen in each case. Sometimes there may be little doub in coming to a decision. For example, the risk o sepsis may be so great from previous interference tha even a hysterectomy may be considered necessary Again, a uterus may be so damaged by previou Cæsarean sections that it may be advisable to sterilis the patient. But nowadays it is rarely right t sterilise after the first Cæsarean section or at a subse quent one if no living child has been born and ha survived, unless the uterine condition is such as t forbid the risk of another pregnancy.

I am indebted to Dr. R. C. Buist and Prof. J. A Kynoch for permission to use their case records.

TUBERCULOSIS OF THE PERICARDIUM

BY W. E. WALLER, M.D. OXF., M.R.C.P. LOND.,
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TUBERCULOSIS of the pericardium is not of ver common occurrence, and many authors deny alto gether the existence of primary pericardial tuber culosis. Hedblom[1] has recently collected from th literature eight cases in which the pericardium wa considered to be the primary seat of the disease F. T. Roberts[2] points out the rarity of miliary tuber culosis of the serous pericardium as compared wit other serous membranes, and states that most of th cases are chronic, and secondary to tuberculosis else where, especially of the lungs and bronchial glands He emphasises the fact that, even in such cases wher pericarditis actually exists, it is sometimes difficul or impossible to prove, either histologically o bacteriologically, its tuberculous origin.

Table I. is an analysis of 83 cases of pericarditi which were admitted into the medical wards o St. George's Hospital between the years 1911 and 192 This number excludes cases of hydropericardium du to back pressure.

TABLE I.—*Analysis of 83 Cases of Pericarditis.*

Type.	No. of cases.	Male.	Female.	Average age.	Per-centage
Rheumatic ..	54	28	26	15·7	65·5
Renal	13	7	6	36·9	15·7
Pneumonic ..	9	7	2	17·3	10·9
Septic	4	2	2	28·7	4·3
Tuberculous ..	3	1	2	20·3	3·6

TABLE II.—*Details of the Three "Tuberculous" Case in Table I.*

Case.	Sex.	Age.	Pericardium.	Tuberculosis elsewhere.	Remarks.
1	M	8	Miliary T.B. of serous coat with effusion.	Caseating tuberculosis of mediastinal glands. Miliary T.B. lungs, pleuræ, and generalised.	—
2	F	50	Chronic adhesive pericarditis. Serous coat studded with tubercles.	Bilateral apical pulmonary tubercle with bilateral pleural effusions.	Old histor pleurisy with effusio
3	F	3	Acute sero-fibrinous pericarditis, with 3 oz. of effusion. Early endocarditis of mitral valve.	Caseating tuberculosis of infratracheal glands. Scattered T.B. in lungs, liver, and elsewhere.	Pericarditi possibl rheumatic i origin.

Table II. gives details of the three cases, 3·6 pe cent. of the total, which were regarded as bein tuberculous in origin. It will be noted that in th first two cases there was miliary tuberculosis of th erous coat, but evidence pointed to the spread of his process from elsewhere. In the third case, the uberculous origin of the process was doubtful.

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[1] Hedblom: Surgical Clinics of North America, Oct. 21st, 1921
[2] Roberts, F. T.: Allbutt and Rolleston's System of Medicine

In view of the preceding remarks, the following ase, which is not included in the above series, is of nterest.

A girl, aged 6, admitted into St. George's Hospital on an. 22nd, 1922. According to her mother, she came of a ealthy stock, had suffered from influenza, possibly accom-anied by left-sided pneumonia, in 1919, but had been erfectly well ever since, until Dec. 28th, 1921. On that lay she was feverish, complained of sore throat and rather evere epigastric pain, unaccompanied by vomiting, which assed off after 24 hours. Subsequently there was no eturn of pain, nor was there undue shortness of breath, ut she remained languid, with lack of appetite, and desire o rest. On Jan. 15th there was rather severe cough, she ppeared very ill, and was feverish at night.

Condition on Admission.—She appeared well nourished, he tongue was coated, the fauces were not injected, and the onsils not large. The temperature was 100·8° F., pulse 140, nd respirations 44. The apex beat could be felt with ifficulty in the normal position; there was no apparent ncrease in the cardiac dullness, though præcordial percus-ion was painful. Heart sounds, though distant, appeared ot abnormal, and no friction or murmurs were present. omparative dullness, with very poor air entry, at both bases.

Course of Case.—Subsequent to admission the tempera-ure was erratic, tending to rise to 100° at times, and some-mes normal for 24 hours, but the pulse and respiration-ate remained high, the degree of illness present greatly xceeding the signs of organic disease. On the 24th a kiagram of chest suggested the presence of fluid at both ases. The pericardial shadow was not unduly large, and howed no truncation of the cardio-hepatic angle. On the 8th the left base was explored, and 150 c.cm. of clear terile fluid was removed, the small lymphocyte being the redominant cell present, though polymorphonuclear and ndothelial cells were also numerous. The course of the isease was unaffected by this procedure, and death occurred ather suddenly and unexpectedly on the 28th.

Necropsy.—Both pleuræ contained 8 oz. of clear fluid, nd there were recent adhesions at both bases. Both he parietal and visceral pleuræ were free from obvious ubercle. The lungs were intensely engorged, with collapse t the bases, but no tubercles were present either on the urface or on section. The pericardium was fairly firmly dherent to the back of the sternum and costal cartilages y rather fleshy pink adhesions, which appeared to consist artly of fibrous tissue and partly of a substance resembling ranulation tissue. There was severe chronic proliferative ericarditis, both fibrous and serous coats being much hickened and laminated, varying in places from ¼ to ½ inch thickness, especially at the apex. The inner surface of he pericardium and epicardium was covered by a thick pile" of granulations, to which were adherent peduncu-ted masses of partially organised lymph, these masses eing remarkably uniform in size, and somewhat resembling melon-seed bodies." Some of these masses formed dhesions between the layers, imperfectly dividing the vity into loculi, which contained a little turbid fluid. No cognisable tubercles were present. The heart muscle, on ction, was firm and good, there being no mural tubercles. he valves were normal. The peritoneum showed severe dema, and contained ten oz. of fluid similar to that om the pleura, but showed no tubercle. The liver was rd, and showed early "nutmeg" change. Scattered over s capsule were a few tubercles of the size of a pin's head, me of them showing commencing caseation, whilst, on ction, a few similar tubercles were scattered throughout. he spleen was hard, firm, and tough on section. On its terior margin was a caseating tuberculous focus of the size a pea, whilst, on section, there were scattered foci re-mbling those of the liver. The kidneys were normal d free from tubercle, and there was no tuberculosis else-here. The lymphatic glands showed no obvious abnor-ality, whilst the infra-tracheal glands, believed by many be the focus from which tuberculosis spreads to the ricardium, were very small and insignificant.

Microscopically, several mediastinal lymph glands were amined, and in all there was marked venous engorgement, ough no tubercle was detected. Sections stained by ehl-Neelsen's method showed no tubercle bacilli. Sections om the pericardium showed great increase in thickness of e fibrous coat, the tissues being laminated and very llular, the spaces between the laminæ being richly infil-ated with round cells, in some places these being so assed as to present the appearance of lymphoid tissue. he serous coat was not recognisable, but was replaced by pical granulation tissue, with loops of new and well-rmed capillary vessels reaching to the surface. No giant-ll systems were recognisable, and no tubercle bacilli were present in the granulation tissue. Sections through the lymph masses showed thick fibrin, with many degenerated white cells and masses of their nuclear debris.

The interest in this case lies in the relation of the pericarditis to the tuberculous lesions, and further emphasises the care with which these cases should be investigated. It was unfortunate that, in this case, no inoculation tests were undertaken with material from the pericardium. The pleural and peritoneal exudates probably resulted from back pressure, a supposition supported not only by the hepatic condition, but also by the remarkable degree of œdema of the peritoneum. If it is assumed that the pericarditis was tuberculous in origin, in view of its chronic proliferative nature it would appear to have been the primary seat of the disease. If, on the other hand, the pericarditis was due to other causes, as from a tonsillar organism, it is difficult to explain the focus from which the miliary tubercles in the spleen and liver originated.

Clinical and Laboratory Notes.

NOTE ON "BAKERS' ECZEMA."

By Arnold Rowsby Tankard, F.I.C.,
PUBLIC ANALYST FOR THE CITY OF HULL.

In January, 1913, a journeyman baker called to show me his forearms, which almost up to the elbows presented a definite eczematous condition. This "eczema" became at times so severe that it was difficult for the bakers to continue their employment. It appeared that several different kinds of wheat-flour were used for bread-making at the bakery in question, but the bakers had noticed that it was only with one brand of flour that the "eczema" made its appearance. Several bakers were affected by irritation of the hands and arms, and later with "eczema," when this particular flour was being worked up.

As a sample of the flour revealed no abnormality of composition when subjected to the usual methods of chemical analysis, I made a careful study of the patent literature dealing with the addition of so-called "improvers" to flour, and from a formidable list of chemicals which have been suggested for this purpose several were chosen for investigation. Without going into further detail, it may be stated that one of the substances considered likely to cause trouble when brought into contact with delicate skin surfaces was potassium persulphate, owing to its known acid formation when moistened with water:—

$$\underset{\text{Potassium persulphate.}}{2\ K_2S_2O_8} + 2\ H_2O = \underset{\text{Potassium acid sulphate.}}{4\ KHSO_4} + O_2.$$

Investigation showed that the suspected flour contained this chemical to an appreciable extent, although the amount was not sufficient to cause any noticeable increase of the normal content of mineral matter present in flour of that grade.

The information given to me by the baker made it quite clear that this flour containing persulphates was the only one causing any trouble, and it was stated that the men were declining to work this particular flour owing to its action on the skin. Later, samples of this flour obtained from the miller on delivery to a local grocer were examined and found to contain potassium persulphate, and action was then taken under the Sale of Food and Drugs Acts against the actual miller for selling flour not of the nature, substance, and quality demanded, by reason of the fact that it contained a foreign mineral substance, potassium persulphate, to the extent of 6·3 parts per 100,000. The case was heard before the stipendiary magistrate at Hull in 1913, the hearing occupying four days, but after the expenditure of a considerable sum of public money, with the sole idea of protecting the public from the undeclared addition of foreign substances to flour—substances which may or may not be harmful, either in themselves or by reason of impurities introduced with them—the case was dismissed, each side paying its own costs. The opinion of the Local Government Board at that period was that the law as it stood was sufficiently strong to prevent such additions, but this case showed that such practices could not be effectually stopped by action under the Sale of Food and Drugs Acts; and although a Bill was introduced some years ago into Parliament making provision for such cases, it was not proceeded with, and the present position remains quite unsatisfactory. It had been hoped by many food chemists and others that the Ministry of Health would before now have taken steps to prevent such additions to flour, but unfortunately nothing has been done in this direction.

The Lancet, in an annotation in its issue of July 7th[1] last, cites a case of sensitisation to wheat-flour which produced chronic eczema in a woman; and O. de Jong, in a recent paper on "A Suggested Ætiology of Bakers' Dermatitis,"[2] accounts for such cases by the presence of salt in the yeast mixture and in the dough handled by bakers. If this explanation is sound, then a similar condition amongst bakers should have been common for many years. This, however, is contrary to my information. It would be interesting to know whether these skin affections among bakery workers occurred with any frequency prior to 1911, the date of the first patent for the use of persulphates as "flour-improvers," and whether the flour handled by de Jong's patients contained this chemical. A flour may appear normal in every respect and yet contain persulphates, for which a specific search must be made. In Hull, at least, common salt without persulphate in the flour caused no such trouble to the bakers in the particular bakery where my informant was engaged.

The cases of "bakers' eczema" which have occurred in this city, so far as they are known to me, have always resulted from the handling of "wetted" flour—that is to say, the dough mixture, which to a greater or less extent comes into contact with the arms during the process of hand-mixing. This is precisely what one would expect in the case of a substance like potassium persulphate, which decomposes fairly rapidly under these conditions, with formation of potassium acid sulphate, as stated. I have no doubt that, so far as the cases brought to my notice in Hull are concerned, the cause was the presence of potassium persulphate in the flour, since (1) only when flour containing potassium persulphate was being used was any skin trouble evident, and then only when the flour was handled in a moistened state; and (2) when this flour was not used, but flour free from potassium persulphate substituted, with salt, yeast, &c., as usual, no trouble was experienced, and the eczematous condition of the skin of the affected workers gradually disappeared.

HERNIA OF THE VERMIFORM APPENDIX THROUGH HESSELBACH'S TRIANGLE.

By Margaret W. Snodgrass, M.B., B.Ch. Belf.,
HOUSE SURGEON, DORSET COUNTY HOSPITAL, DORCHESTER.

The following case of a hernia of the appendix merits record:—

A male, aged 70, was admitted to this hospital under the care of Mr. W. B. Cosens with the diagnosis of right strangulated hernia. He had a previous history of left inguinal hernia for 20 years, with no history of any trouble on the right side. On examination a tumour, the size of a small tangerine orange, was found occupying the region just above the inner third of the right Poupart's ligament; the mass was tender, with slight lateral movement, and pain was referred to the umbilicus. The early symptoms of strangulation had been present for 24 hours.

Operation revealed the appendix in a mass of omental adhesions passing through Hesselbach's triangle; the inguinal canal was normal.

It would be interesting to know if there has been any case reported of the appendix *alone* finding its way through this anatomical region.

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[1] The Lancet, 1923, ii., 28.

[2] Ibid., 1923, i., 894.

Reviews and Notices of Books.

The Older Universities of England: Oxfor and Cambridge.

By Albert Mansbridge, Hon. M.A. Oxon
London: Longmans, Green and Co. 192
Pp. 296. 7*s.* 6*d.*

This remarkable book is written by one who wa not educated at either university, but who in som mysterious way understands the university spirit an is quite alive to the influence which Oxford an Cambridge should, and as a rule do, exercise. Ther are still some who sigh for the placid days befor 1850 when the Commission was instituted which s vexed the soul of Archdeacon Grantly and man another, when the Hebdomadal Council was al powerful and when Newman in the pulpit of th University Church was making young men to realis the fact that they had spiritual duties to perform.

It was between 1870 and 1880 that both universities awoke to the fact that what is now calle "social service" was a duty which the rich owed t the poor, and a university sermon by Pusey preache in 1875 laid solemn stress upon this:—

> "Many of you, my sons, are provided with superfluities You have not to stint yourselves as to the pleasures of you age. Day by day, I suppose, passes with all convenience of life or amusement, or some self-indulgences, which thoug not directly sinful, are rather injurious. If our Lord wa to come now, in how many do you think that you coul tell Him that you had fed Him, clothed Him, supplied Hi when sick? Some, I fear, could not say that they ha bestowed as much upon Christ as upon their dogs."

But though individual members of the university as is shown by the foundation of university settlements, were not deaf to the call of those who ha never enjoyed a university career, practically nothin was done to make the way of the poor scholar easier One of the evils wrought by the Commission of 185 was the abolition of the "poverty clauses" and th substitution of "merit" which meant ability to pas examinations, an abolition which Dean Burgo deplored (v., p. 109). So, says Mr. Mansbridge on th same page, "the most difficult time for the poo scholar to get to Oxford or Cambridge was from 185 to 1904." But although Mr. Mansbridge is all fo giving working men and women every facility of acces to university life and teaching he is no iconoclast He recognises that there is in university life a atmosphere or environment which makes men lov knowledge for its own sake and not for that of utility

> "Directly Oxford and Cambridge seek to conform themselves to modern needs, to justify themselves to the Philistine outside—however excellent in other ways such Philistine may be—they may do more work which can be recorded i elaborate tomes, they may send out more young men t perform the tasks of the city and the factory, but they wil lose that ineffable charm, that pulsating power, tha mysterious influence which calls forth the veneration o men in other universities and in other lands,"

and he quotes with approval the remark of a Maste of Corpus, Cambridge: "Cambridge is not primaril a place of learning or a place of examination. It i a place where you live three years."

Mr. John Mansbridge's illustrations are worthy o the book, especially the reproductions from penci sketches; his drawings in Loggan's style are not s successful and the view of Magdalen is really bad. We have noticed a few slips in the text—e.g., on p. 217 Tennyson's date is given as 1809–1902, instead of 1892, and in the index Dr. Routh is entered a Master of Magdalen instead of President. But unti we read the book we could not have believed that an outsider could so have caught the spirit of a university or have written so sympathetically. Mr. Albert Mansbridge was nominated as one of the Commissioners of 1919–22 and no better selection could have been made. Every university man and every man who seeks to be a university man should read the book.

ONTRACEPTION (BIRTH CONTROL): ITS THEORY, HISTORY, AND PRACTICE.

A Manual for the Medical and Legal Professions. By MARIE CARMICHAEL STOPES, D.Sc. Lond., Ph.D. Munich, Fellow of University College, London. London: John Bale, Sons and Danielsson. 1923. Pp. 417. 12*s.* 6*d.*

Dr. Stopes tells us in her preface that this book presents the arduous toil of four years ; in it she has ideavoured to set out clearly all that is valuable of vailable knowledge on contraception, hoping thus to ive cleared the way for the initiation of deeper searches as well as for the determination of the best actical means of contraception to suit specific cases. the 14 chapters which follow Dr. Stopes sets out th precision and no little literary grace the problem contraception as she sees it, the indications for use, a description of contr aceptives desirable and idesirable, answers to some objections which have en raised, the history of its practice in this and her countries, and a note on the need for instruction medical schools. Finally, she describes the daily actice of the birth control clinic inaugurated by her Holloway. The parents visiting this clinic are, . Stopes tells us, made to feel that they come not to lk about disease, nor to be subjected to operation, t "to discuss in an inspiring way in attractive rroundings one of the greatest and one of the most cially vital questions which arise in their lives." No ter of introduction is required, no fees are taken. ly mother or father, who desires to do so, can walk o the clinic at any time. The simple and decent ocedure is described, and Dr. Stopes adds that few men require a second instruction, although the endly atmosphere of the clinic and the sympathy of nurse encourage them to come again if difficulty uld arise. Dr. Stopes concludes her book by scribing the practice of contraception as "in many ys the connecting link between health and disease." e prime object of the medical profession being the alth of the community, she regards a full knowledge contraception as one of the doctor's most useful juncts, for "when used by diseased persons contracep- n becomes the great preventive measure to arrest the ead of disease and degeneracy through the nation." find some essential truth in this declaration along h some of the exaggeration which is characteristic the prophet who believes that a message is entrusted him or her alone. Just as it is futile to try to mote the general health of the community without intimate study of the early beginnings of disease the deviations from normal function, so no doubt practice of normal healthy sex relations cannot be on a firm footing without close study.

Much of the evidence contained in the book is te unobtainable elsewhere, for the author has n the confidante of hosts of marital difficulties. re it not in fact for the opening pages of the volume medical reader would feel inclined to accept it as ext-book on a specialty in which the author has de herself proficient. But a feeling of doubt and plexity is engendered by the extraordinary number ntroductions from distinguished medical men and nen which precede the opening chapter. Sir liam Bayliss first sets out the two chief arguments avour of birth control, the one being the relief of mother from the results of frequently repeated gnancies, the other, like unto it, being the possi- ty of a normal and beautiful married love—a sibility which, he adds, Dr. Stopes has had the our of bringing out into a clear light. The records t at the mother's clinic will, he hopes, in time lead he accumulation of valuable information so that may be able presently to recommend the best hod in any given case and to issue warning against use of those likely to be injurious. Sir James Barr roaches the subject from the racial point of view laughs to scorn the argument that if young women w the use of contraceptives they would lose any ality which they now possess. The sentimental f contained in prurient novels should, he thinks, be replaced by genuine information. The innocence of ignorance is not worth preserving. Dr. Christopher Rolleston testifies to the value of Dr. Stopes's book to the medical officer of the smaller English counties who, unlike his brother in larger cities, comes into intimate clinical contact with his neighbours from their birth (or before) to their death. Dr. Jane Hawthorne adds a brief benediction and a medical barrister-at-law, who signs himself "Obscurus," justly compliments the author on having given references for every quotation she has made, but does her disservice in stating that, had she been on the Medical Register, she might well have been cited before the General Medical Council to answer for her views. Whatever disciplinary terrors the Council may wield, it certainly never questions the right of the thinking men or women whom it registers to hold what views are dictated to them by knowledge or conscience.

NEUROLOGICAL DIAGNOSIS.

Kompendium der topischen Gehirn- und Rückenmarksdiagnostik. By ROBERT BING, Professor in the University of Basel. Fifth enlarged and corrected edition. Berlin and Vienna: Urban and Schwarzenberg. 1922. With 102 illustrations, partly in colour. Pp. 242. M.450.

Dr. Robert Bing's book on neurological diagnosis is well known in this country and has been frequently reviewed in these columns. The latest edition contains various additions and corrections which do not add materially to its length. There are some new diagrams and illustrations, the former characterised by the same simplicity and clearness that have been features of Dr. Bing's diagrams from the outset. Eschewing controversy and speculation, the author confines himself, with singular success, to the anatomy and physiology, normal and pathological, of the nervous system, and if it is impossible for him to avoid some vexed questions—e.g., that of the relation of the corpus striatum to other centres, above and below—his teaching is sufficiently definite to be instructive, even though exception might easily be taken to some of his statements. One or two of the criticisms we offered in a previous review have been met, but there are others which if accepted would, we believe, bring the work even more close to that ideal of neurological doctrine which every teacher desires. The fact that a fifth edition is issued is comment enough on the practical nature of this compendium, which can once more be recommended to all students of the nervous system and its disorders.

TUBERCLE BACILLUS INFECTION AND TUBERCULOSIS IN MAN AND ANIMALS.

By Albert Calmette. Authorised translation by WILLARD B. SOPER, M.D., and GEORGE H. SMITH, Ph.D. Baltimore, U.S.A.: Williams and Wilkins Company. 1923. Pp. 689.

THE original French edition of this valuable book was noticed in THE LANCET (1920, ii., p. 74) on its publication, and though there is little to add to what was then said, it is a pleasure to welcome this authorised English edition. The translators have performed their task admirably, and have added the index which was omitted from the original work, after the regrettable custom of France. They have been ably supported by their publishers and the result is a volume which should be in the library of every student of tuberculosis, whether he works on the clinical side or in the laboratory. Quite apart from the wealth of information it contains, this monograph has a value which it is difficult to overestimate. The author's individuality is stamped on every page, and he has given us not only a brilliant account of the present state of knowledge of tuberculosis, but also a model of what constitutes the best type of scientific work.

HÆMATOLOGY AND HISTOLOGY.

Traité technique d'hématologie, morphologie, histogenèse, histophysiologie, histopathologie. Par J. JOLLY, Directeur du Laboratoire d'Histologie de l'École dés Hautes Etudes au Collège de France. Paris: A. Maloine et Fils. 1923. With 69 figures in the text and one coloured plate. Two vols. Pp. 1130. Fr.70.

THE author holds that all sound biological work must rest upon a basis of morphology and histology, and he has furnished the proof of his doctrine, if any proof is necessary, in this exhaustive treatise. It is essentially a monograph on the structure of the cellular elements of the blood, but Mr. Jolly loses no opportunity of pointing out how function depends on structure, and how the one varies with the other. The book is planned on the broadest possible lines. The first few pages contain instructions how to obtain blood from animals, birds, fishes, and reptiles, and though naturally man is the chief subject of observation, the author never hesitates to refer to lower orders of life when necessary. Though the morphology and the quantitative variations of the cells of the circulating blood, including, we may note, the platelets, are treated of in detail, this aspect of the question forms only a part, and not the greater part, of the book. The wandering cells of the tissues in normal and pathological states are described at length; and there are equally comprehensive chapters dealing with the structure of lymphadenoid tissue, the spleen, the bone-marrow, and the thymus. There are chapters on hæmoglobin, the coagulation of the blood, hæmolysis, and histogenesis. The last chapter on the relations of the blood with the body and with the outside world is not the least valuable. Mr. Jolly has written a truly philosophical treatise on an intensely interesting subject. If we have omitted to mention that there are chapters dealing with the anæmias and the leukæmias it is because these abnormal states are put in their proper place; they exist, and they are faithfully dealt with, but for Mr. Jolly the study of the blood means much more than it does to most medical authors. The illustrations are adequate, and the format of these paper-bound volumes leaves nothing to be desired.

VENTILATION.

The Ventilation of Public Buildings. By ROBERT BOYLE. London: Robert Boyle and Son. 1923. Pp. 51. 6*s*.

THIS very short book contains a compilation of statements by various individuals in favour of the natural system of ventilation. There is little general information on ventilation, the object apparently being to advertise the fact that the consensus of opinion in this country is in favour of the natural system of ventilation and opposed to all artificial systems. The book is illustrated.

Calculations in Heating and Ventilation. By G. S. COLEMAN, D.Sc., Assoc.M.Inst.C.E., Director of the Department of Municipal and Sanitary Engineering in the Municipal College of Technology, Manchester. London: Longmans, Green and Co. 1923. Pp. 249. 15*s*.

THE main object of this excellent book is to provide working examples for students taking the second and third years in the advanced course in heating and ventilating engineering at the Municipal College of Technology, Manchester. The author claims no originality and expresses his debt to the more comprehensive and standard works. In addition to the chapters on calculations, there are chapters on mechanics and physics, conveniently placed for reference, and a means of saving the student much time. The book contains instructive illustrations, tables, and charts, and also much technical information in a readable form. More space could have been allotted with advantage to the kata-thermometer, an instrument which has now proved its value in many countries.

DELAFIELD AND PRUDDEN'S TEXT-BOOK PATHOLOGY.

Twelfth edition. Revised by FRANCES CART WOOD, M.D., Director of the Pathological Depar ment, St. Luke's Hospital, New York; Direct of the Institute of Cancer Research, Columb University, New York. New York: William Wo and Co. 1922. Pp. 1354. 63*s*.

THE twelfth edition of this excellent text-bo differs little from the previous one published in 19 though it has been subjected to a careful and detail revision. The sections on the liver and the centr nervous system contain a good deal of new matter a are improved by additional and useful illustration and portions of the section on tumours have been written. By careful pruning the author has succeede in effecting these changes without increasing the si of the book, which remains one of the most satisfacto examples of its kind.

A SURGICAL ATLAS.

Spezielle Chirurgie. Part II. Second edition. B Prof. G. SULTAN. München: J. F. Lehman 1923. Pp. 576. 14*s*. 5*d*.

THIS is a revised edition of a well-known surgic atlas. The illustrations do not differ very much fro those which appeared in the former edition, but th letterpress has been considerably altered. Certa illustrations and descriptions might well have bee omitted, such as Kocher's method for the radical cu of hernia, and possibly, too, the technique of the use Murphy's button, which now is only of historic interest. There are some rare conditions depicte which one very seldom meets. The atlas is a collectio of extremely good pictures which really help th student to visualise disease which he may not have ha an opportunity of seeing.

DISEASES OF SALIVARY GLANDS AND PANCREAS.

Nouveau traité de médecine. Vol. XV. *Gland salivaires, pancréas, et péritoine.* Edited b G. H. ROGER, FERNAND WIDAL, and P. J. TEISSIE Paris: Masson et Cie. 1923. Pp. 568. Fr. 40.

THE fifteenth volume of this System of Medici bears the same signs of scholarship and scrupulo preparation that we have observed in earlier volume Dr. E. Parmentier and Dr. Etienne Charbrol a responsible for the section dealing with the saliva glands and the pancreas. We have been particular impressed by their excellent discussion of the patholo of diabetes. In reading this article on page 8 with its cold and logical exposition of the arguments f and against the pancreatic theory, one feels th enormous importance of the work of F. G. Banti and how sensibly future progress in pathology must b modified by this new knowledge. The problems pancreatitis are no less ably dealt with, this sectio being, like others, enriched by collections of statisti which are of great value. The major portion of th last section of the volume, which deals with diseases the peritoneum, is by Dr. Paul Londe, and is marke by the same scrupulous care. We have no hesitatio in recommending this as an admirable reference wor

JOURNALS.

TROPICAL DISEASES BULLETIN. July, 1923.—A instructive feature of the July number of the *Tropic Diseases Bulletin* is the critical review, by C. M Wenyon, of the bodies in the blood which have, fro time to time, been described as "hæmogregarines of man.—Clayton Lane contributes a number reviews on malaria, while C. M. Wenyon is responsib for the sections dealing with kala-azar, relapsing feve infectious jaundice, and yellow fever.—Novel labora tory methods are summarised by J. D. Thomson, an under the miscellaneous category subjects such a psychoses and rabies are dealt with.

THE MEDICAL REGISTER: UNTRACEABLE PRACTITIONERS, H TO O.

WE are requested by the Registrar of the General Medical Council publish the following list of medical practitioners who have not plied to his inquiries as to the accuracy of their addresses. The t includes all untraceable names from H to O in the body of the Medical egister, as it is only this section which has come under review this ar. Anyone who finds his or her name included in this list should mmunicate immediately with the Registrar of the General Medical uncil, 44, Hallam-street, Portland-place, London, W. 1. Since this t was prepared a large number of further inquiries have been sent out, t it would be advisable that in all cases in which a practitioner's me appears in the list a communication should be addressed to the egistrar.

ckett, Henry W., L., L.M.R.C.P. 1917 (I).
igh, William E., M.R.C.S. 1909 (E).
lahan, Samuel H., M.B. 1885 (I).
ll, Alexander R., M.R.C.S. 1902 (E).
ll, Thomas Gibson H., L.R.C.S. 1883 (I).
ll, Thomas Greenwood, M.B. 1891 (E).
llam, Walter, M.R.C.S. 1874 (E).
milton, Archibald A., M.B. 1880 (I).
milton, Chas. K. J., M.B. 1920 (E).
milton, Jas. A. G., M.B. 1876 (I).
milton, Percy D., M.R.C.S. 1912 (E).
milton, Reginald H., L.M.K.Q.C.P. 1889 (E).
milton, Roger K., M.R.C.S. 1896 (E).
milton, Seton Guthrie, M.R.C.S. 1879 (E).
nce, James B., *O.B.E.*, M.R.C.S. 1911 (E).
nly, Edward, M.D. 1879 (I).
nly, John Joseph, L.R.C.P. 1884 (E).
nnen, John J., M.R.C.S. 1885 (E).
nnigan, Charles Ignatius, M.B. 1914 (I).
nnigan, Francis, L., L.M.R.C.P. 1912 (I).
nson, Reginald J. E., *O.B.E.*, M.B. 1896 (E).
nwell, Gerald L., M.R.C.S. 1896 (E).
rdy, George F., *M.C.*, M.R.C.S. 1905 (E).
rper, Rodolphus W., M.B. 1905 (I).
rris, Edward Temple, *D.S.O.*, B.C. 1903 (E).
rris, Matthew H., M.B. 1903 (E).
rrison, Herbert M., M.R.C.S. 1895 (E).
rrison, Howard D., M.R.C.S. 1912 (E).
rrison, Richard, L.R.C.P. 1884 (E).
rrison, Thomas, L.R.C.P. 1909 (E).
rt, Charles Herbert, M.R.C.S. 1911 (E).
rtgill, Wm. C., *M.C.*, M.R.C.S. 1914 (E).
rvey, Frederick George, M.R.C.S. 1875 (E).
slam, Sarah Kate K., L.S.A. 1901 (E).
stings, John P., M.R.C.S. 1907 (E).
therly, Henry R., M.R.C.S. 1864 (E).
ughton, Wm. S., M.B. 1894 (I).
w, Walter H., M.R.C.S. 1884 (E).
wker, Walter, L.S.A. 1891 (E).
wkins, Charles Thomas, M.R.C.S. 1908 (E).
wks, Francis S., L.M.S.S.A. 1908 (E).
yden, Richard H. H., L., L.M.R.C.P. 1892 (I).
yes, Richard F., L., L.M.R.C.P. 1905 (I).
yes, Wm. B., M.D. 1886 (I).
yne, Percy A., M.R.C.S. 1902 (E).
ysom, Nathan N., M.R.C.S. 1916 (E).
yward, John W., M.R.C.S. 1864 (E).
ad, Ernest Edward, M.R.C.S. 1895 (E).
ad, Percy T. J., L.S.A. 1876 (E).
aly, Denis, M.B. 1921 (I).
arn, Douglas E., L.M.S.S.A. 1917 (E).
bbert, Charles A., M.R.C.S. 1880 (E).
berden, Wm. S., M.R.C.S. 1889 (E).
eland, Patrick A., L.R.C.S. 1885 (I).
garty, Andrew, M.D. 1868 (I).
garty, Patrick N., L., L.M.R.C.P. 1919 (I).
nnessy, Cornelius, L., L.M.R.C.P. 1918 (I).
nnessy, Thomas, L., L.M.R.C.P. 1894 (I).
nry, Edwin, M.R.C.S. 1892 (E).
nry, John R., M.B. 1913 (I).
nry, Louis, L.R.C.P. 1878 (E).
pburn, John, L.S.A. 1880 (E).
pper, Evelyn C., M.R.C.S. 1900 (E).
rring, Edward K., M.R.C.S. 1896 (E).
slop, William J., L.M.K.Q.C.P. 1877 (E).
therington, Charles E., M.B. 1870 (I).
ywood, Thomas, M.R.C.S. 1892 (E).
key, Augustus J., *M.C.*, M.R.C.S. 1910 (E).

Hickey, Patrick C., M.D. 1879 (I).
Higgins, George H., M.R.C.S. 1876 (E).
Hill, John S., M.B. 1883 (E).
Hill, John T., L., L.M.R.C.P. 1912 (I).
Hill, Richard A. P., M.R.C.S. 1906 (E).
Hindle, Francis Joseph, L.R.C.P. 1880 (E).
Hislop, Walter J. H., M.B. 1896 (E).
Ho, Shai C., L.M.S.S.A. 1918 (E).
Hodder Williams, F. G., M.B. 1908 (E).
Hodgins, Emerson Le R., M.R.C.S. 1907 (E).
Hogg, Charles A., M.B. 1893 (E).
Holden, Frank N., L., L.M.R.C.P. 1908 (I).
Holland, Edward, M.B. 1921 (I).
Holland, James F. R., M.D. 1879 (E).
Holland, James K., L., L.M.R.C.P. 1917 (I).
Holmes, Arthur N., M.B. 1901 (I).
Holmes, John, M.R.C.S. 1897 (E).
Hood, James C., M.D. 1883 (I).
Hooper, Ebenezer, L.S.A. 1886 (E).
Hooper, Henry Walpole, M.R.C.S. 1883 (E).
Hope, Edward C., M.R.C.S. 1896 (E).
Hopkins, John, M.R.C.S. 1869 (E).
Horan, John W., M.B. 1915 (I).
Hosford, John S., M.R.C.S. 1895 (E).
Hounsell, F. C. W., M.R.C.S. 1886 (E).
Howard, Robert N., M.R.C.S. 1880 (E).
Howden, Patrick F., L.S.A. 1905 (E).
Howson, Frank, M.R.C.S. 1910 (E).
Hoysted, L. N., M.R.C.S. 1887 (E).
Hoyte, S., M.R.C.S. 1910 (E).
Hoyten, W. J., M.R.C.S. 1894 (E).
Hughes, Hugh L., L.S.A. 1886 (E).
Hughes, Wilfrid K., M.R.C.S. 1890 (E).
Hull, Walter, M.R.C.S. 1882 (E).
Humphreys, Miss L. N., M.B. 1920 (I).
Humphry, Ernest, L.S.A. 1884 (E).
Hungerford, L. M. T., L., L.M.R.C.P. 1889 (I).
Huntley, Miss E. A., L.R.C.P. 1887 (E).
Hutchinson, C. G., L.K.Q.C.P. 1885 (E).
Hutton, John, M.R.C.S. 1887 (E).
Hyde, Edwin, M.R.C.S. 1902 (E).
Hynes, A. M., M.R.C.S. 1873 (E).

Iddon, T. W., M.R.C.S. 1887 (E).
Ironside, Miss C. M., *M.B.E.*, M.B. 1903 (E).
Irwin, Miss M. E., M.B. 1918 (I).
Island, Robert L., L.K.Q.C.P. 1886 (I).

Jackson, George H., M.R.C.S. 1878 (E).
Jackson, Harold E. A., M.R.C.S. 1901 (E).
Jackson, Herbert V., M.R.C.S. 1920 (E).
Jacques, Harold, L.S.A. 1903 (E).
Jakins, Wm. V., M.R.C.S. 1858 (E).
James, Walter E., M.R.C.S. 1890 (E).
Jameson, G. B., M.R.C.S. 1913 (E).
Jarrett, M. L., M.R.C.S. 1874 (E).
Jarvis, J. H. E., M.R.C.S. 1887 (E).
Jenkins, Arthur W., M.R.C.S. 1894 (E).
Jenkins, N. R., M.R.C.S. 1917 (E).
Jeppe, T. J. J., M.R.C.S. 1913 (E).
Johnson, Frederick, M.R.C.S. 1891 (E).
Johnson, J. B., L.S.A. 1881 (E).
Johnson, Reginald, M.B. 1912 (I).
Johnston, George D., M.R.C.S. 1883 (E).
Johnston, H. S., L.M.R.C.P. 1908 (I).
Johnston, James P., L.M.R.C.P. 1910 (I).
Johnstone, J. G., M.R.C.S. 1921 (E).
Jones, E. A., M.R.C.S. 1902 (E).
Jones, F. W., M.R.C.S. 1904 (E).
Jones, G. B. M., M.R.C.S. 1886 (E).
Jones, John, M.R.C.S. 1904 (E).
Jones, R. T., L.R.C.P. 1893 (E).
Jones, T. S., M.R.C.S. 1885 (E).
Joseph, G. W., L.K.Q.C.P. 1873 (E).
Joule, John, L.S.A. 1892 (E).
Joy, H. R. L., M.B. 1896 (I).
Joyce, T., M.R.C.S. 1858 (E).
Joynt, H. W., L.Med., L.S. 1870 (I).
Judah, N. J., M.B. 1911 (E).
Judd, C. F., M.B. 1913 (I).
Juett, A., M.B. 1913 (E).
Jurriaanse, A., L.S.A. 1903 (E).

Kaka, S. M., M.R.C.S. 1885 (E).
Kamchorn, N., M.R.C.S. 1917 (E).
Kan, T. L., M.R.C.S. 1916 (E).
Kapo, S., M.B. 1912 (E).
Kapur, K. L., M.B. 1912 (E).
Kauffmann, O. J., M.R.C.S. 1885 (E).
Kay, H. W. A., L.M.R.C.P. 1908 (I).
Kaye, W. H., M.R.C.S. 1904 (E).
Kean, Edmund, M.B. 1916 (I).
Keats, B. A., L.M.S.S.A. 1909 (E).
Keegan, J. M., M.B. 1890 (I).
Keess, Arthur, L.R.C.P. 1882 (E).
Kelly, C. I., L.S.A. 1891 (E).
Kelly, I. P., M.B. 1911 (I).
Kelly, J. B., L.M.R.C.P. 1907 (I).
Kelly, Thomas, L.M.R.C.P. 1904 (I).
Kelly, Thomas, M.B. 1916 (I).
Kelly, T. J., L.Med. 1872 (I).
Kelly, T. J. B., L.M.R.C.P. 1905 (I).
Kelly, William, M.R.C.S. 1872 (E).
Kelman, G. A. E., M.R.C.S. 1911 (E).
Kendall, N. E., M.R.C.S. 1915 (E).
Kendle, F. W., M.R.C.S. 1884 (E).
Kenna, P. J., M.B. 1888 (E).
Kennedy, J. S., M.R.C.S. 1915 (E).
Kennedy, O. E., M.R.C.S. 1920 (E).
Kennedy, Patrick, L.R.C.S. 1873 (I).
Kerans, Robert, L.R.C.S. 1863 (I).
Kerr, C. D., M.B. 1911 (E).
Kerr, T. B., M.B. 1896 (I).
Kerrigan, O. P., L.R.C.P. 1880 (I).
Kerruish, Miss F. M., M.R.C.S. 1918 (E).
Kerswill, J. B., M.R.C.S. 1865 (E).
Keys, S. H., M.R.C.S. 1914 (E).
Khan, M. A., M.R.C.S. 1889 (E).
Kiernan, P. J., L.R.C.S. 1884 (I).
Kilgarriff, J. O., M.B. 1889 (I).
Kincaid, F., M.R.C.S. 1902 (E).
King, F. W. R. J., M.R.C.S. 1890 (E).
King, G. W., M.R.C.S. 1914 (E).
King, T. W., M.D. 1862 (E).
Kinsella, J. J., M.B. 1897 (I).
Klein, B. G., M.B. 1908 (E).
Knaggs, S. T., L.K.Q.C.P. 1870 (I).
Knapp, Arthur E., L.Med., L.S. 1907 (I).
Knight, W. J. R., *M.C.*, M.D. 1881 (I).
Knocker, W. D., M.R.C.S. 1895 (E).
Knott, M. O., L.R.C.S. 1863 (I).
Knox, C. F., M.R.C.S. 1874 (E).
Koch, J. A., L.M.S.S.A. 1909 (E).
Kochhar, M. R., L.R.C.P. 1911 (E).

Labiebe, K. M., M.B. 1914 (E).
Lamb, H. T., *M.C.*, L.M.S.S.A. 1916 (E).
Land, Mrs. D. E., L.R.C.P. 1910 (E).
Lane, C. A., M.R.C.S. 1893 (E).
Lane, James, L.M.R.C.S. 1882 (I).
Lane, J. S., L.M.R.C.P. 1901 (I).
Lane, W. F., L.M.R.C.P. 1909 (I).
Langley, J. T., M.R.C.S. 1865 (E).
Langston, T., M.R.C.S. 1863 (E).
Lanyon, E. T., M.R.C.S. 1896 (E).
Larche, J. E., M.B. 1915 (E).
Larsen, Miss C., M.B. 1912 (E).
Latimer, G. D., M.B. 1913 (I).
La Touche, E. D., L.R.C.S. 1884 (I).
Lauder, J. L., *D.S.O.*, *M.C.*, M.R.C.S. 1913 (E).
Lawrence, A. A. H., M.R.C.S. 1905 (E).
Lawson, E. F., M.B. 1911 (I).
Lea, J. A., L.R.C.P. 1870 (E).
Le Bas, Dumaresq, M.R.C.S. 1903 (E).
Leech, J. R., M.D. 1872 (I).
Leeder, F. B., M.R.C.S. 1891 (E).
Leeper, B. C. A., L., L.M.R.C.P. 1907 (I).
Lehmann, Mrs. H. B. A., L., L.M.R.C.P. 1881 (E).
Lennon, John, M.B., 1896 (I).
Leonard, Miss E., L.R.C.P. 1902 (E).
Leonard, Napoleon, M.R.C.S. 1902 (E).
Lester, F. H., B.C. 1909 (E).
Lethbridge, C. F., M.R.C.S. 1865 (E).
Lever, J. M., M.B. 1917 (E).
Leviseur, H. J., M.R.C.S. 1918 (E).
Levy, O. L., M.R.C.S. 1895 (E).
Lewellin, A. J. R., L.K.Q.C.P. 1879 (E).
Lewin, Miss J. A., M.B. 1904 (E).
Lewis, F. W., M.R.C.S. 1894 (E).
Lewis, Stanley, M.B. 1891 (E).
Lewis, T. P., M.R.C.S. 1876 (E).
Leyland, P. F. J., L., L.M.R.C.P. 1906 (I).
Libby, H. S., M.R.C.S. 1900 (E).
Liebson, S. A., M.R.C.S. 1915 (E).
Lilley, J. H., M.B. 1884 (E).
Lillies, H., M.R.C.S. 1879 (E).
Lindesay, V. E. H., M.B. 1893 (E).
Lindsay, E. A., M.R.C.S. 1908 (E).
Lindsay, F. W., L.R.C.P. 1870 (I).
Link, O. C., M.B. 1914 (E).
Lishman, R. R., M.B. 1914 (E).
Litchfield, E. M., M.R.C.S. 1915 (E).
Little, J. H., M.B. 1871 (E).

Lloyd, H. C., M.B. 1893 (I).
Lloyd, J., M.B. 1889 (E).
Locke, T. W. S., M.R.C.S. 1855 (E).
Lodge, Miss H., M.B. 1921 (E).
Loftus, M. J., L.R.C.P. & S. 1915 (I).
Logan, Miss M. E. M., L.R.C.P. & S. 1902 (I).
Loganadan, A. D., M.R.C.S. 1916 (E).
London, J. E., M.R.C.S. 1883 (E).
Long, Mrs. N., M.B. 1913 (E).
Longson, F. M., M.B. 1905 (E).
Loudon, John, M.B. 1912 (E).
Loughran, D. J., M.B. 1920 (I).
Lovegrove, Charles, M.R.C.S. 1859 (E).
Lovegrove, Charles, L.R.C.P. 1881 (E).
Lowe, C. H., M.R.C.S. 1873 (E).
Lowe, P. R., *O.B.E.*, L.S.A. 1896 (E).
Lowne, B. T., M.R.C.S. 1861 (E).
Lubbe, W. P., M.B. 1917 (I).
Lubeck, W. J., M.R.C.S. 1896 (E).
Lucas, R. H., *O.B.E.*, *M.C.*, M.R.C.S. 1913 (E).
Luffman, W. C., L.R.F.P.S. 1873 (E).
Lush, J. S., L.S.A. 1875 (E).
Lyden, M. A., L.R.C.P. 1881 (I).
Lyle, C. C. V., L.R.C.P. 1886 (E).
Lynch, J. A., M.B. 1916 (I).
Lynch, Stephen F., M.R.C.S. 1897 (E).
Lynch, W. W., M.R.C.S. 1901 (E).
Lyne, C. V. N., M.R.C.S. 1914 (E).

Maaz, M. F., M.R.C.S. 1910 (E).
Macabe, J. J., M.B. 1918 (I).
McAleer, James, L.R.C.P. & S. 1919 (I).
MacAlevey, G. E., *M.C.*, M.R.C.S. 1918 (E).
MacAlevey, W. C., L.R.C.P. 1877 (E).
McAlister, H. C., M.R.C.S. 1918 (E).
McArthur, A. N., M.R.C.S. 1895 (E).
McAuley, J. H., L.R.C.P. & S. 1884 (I).
McBurney, J. H., M.B. 1895 (I).
MacCabe, F. F., M.B. 1894 (I).
McCabe-Dallas, D. C., L.R.C.P. & S. 1907 (E).
McCarthy, C. W., L.R.C.S. 1872 (I).
McCarthy, Henry, L.R.C.S. 1889 (I).
MacCarthy, Philip, L.R.C.P. & S. 1908 (I).
MacCarthy, Randal, L.R.C.P. & S. 1892 (I).
MacCarvill, Patrick, M.B. 1917 (I).
McCausland, J. E., M.B. 1908 (I).
McCausland, S. R., L.R.C.P. & S. 1901 (I).
McCleland, H. A., M.R.C.S. 1893 (E).
McCombe, John, M.R.C.S. 1901 (E).
McConkey, J. T., L.R.C.P. & S. 1915 (I).
McCormack, W. J., L.R.C.P. & S., 1906 (I).
McCullagh, C. H. W., M.B. 1897 (I).
McCullagh, J. T., M.B. 1914 (I).
McCulloch, Miss E. E., M.R.C.S. 1921 (E).
McDermott, Bryen, M.R.C.S. 1912 (E).
McDonagh, G. R., L.R.C.P. 1877 (E).
McDonagh, J. M., L.R.C.S. 1882 (E).
McDonagh, J. E., M.B. 1921 (I).
McDonald, Edward, M.B. 1897 (I).
McDonald, T. S., M.B. 1917 (I).
MacDonell, James A., M.B. 1882 (E).
McDonnell, Charles, L.R.C.P. & S. 1913 (I).
MacDonnell, Henry C. B., L.R.C.S. 1860 (I).
McDonnell, Joseph, L.R.C.P. & S. 1864 (I).
McDonnell, N. J., M.D. 1884 (I).
McDonnell, P. M., M.B. 1920 (I).
MacDonogh, J. D., L.R.C.S. 1885 (E).
McDonough, P. H., L.R.C.P. & S. 1912 (I).
McDougall, Richard, M.B. 1873 (E).
McDougall, Wm., M.B. 1897 (E).
McDowell, S. E. C., L.R.C.P. 1886 (E).
McElwee, Daniel, M.B. 1920 (I).
McEnery, W. A., M.R.C.S. 1900 (E).
McEntire, R. G. J., M.B. 1912 (I).
McEvedy, P. F., M.R.C.S. 1906 (E).
McGann, Michael, L.R.C.P. & S. 1893 (E).
McGettigan, John, M.B. 1917 (I).
McGuire, Miss Alice, M.B. 1921 (I).
McGuire, Michael, M.B. 1911 (I).
McGuire, W. G., L.R.C.P. & S. 1911 (I).
McGurk, D. J., M.B. 1919 (I).
McHale, P. J., L.R.C.P. & S. 1895 (I).
McIlroy, P. T., M.R.C.S. 1920 (E).
Mackay, Henry, M.B. 1889 (E).
McKay, James, *M.C.*, M.B. 1915 (I).
McKee, J. T., L.R.C.P. & S. 1910 (I).
McKee, J. W., M.B. 1917 (I).
McKee, William, M.B. 1907 (I).
Macken, Hubert, M.B. 1918 (I).
McKendry, T. T., M.B. 1894 (E).
McKenna, Miss M. C., M.B. 1914 (I).
McKenzie, Archibald, M.B. 1883 (E).
Mackenzie, F. M., M.R.C.S. 1866 (E).
MacKenzie, J. R. M., *M.C.*, M.B. 1916 (I).
MacKenzie, W. G., L.R.C.P. & S. 1877 (I).
Mackew, Samuel, M.B. 1881 (E).
Maclachlan, R. C., M.B. 1900 (E).
MacLaughlin, C. M., M.B. 1888 (I).
MacLean, C. M., M.R.C.S. 1906 (E).
McLean, W. W. L., L.S.A. 1886 (E).
MacLeod, A. D., L.R.C.S. 1886 (I).
McLeod, T. H., M.R.C.S. 1917 (E).
MacLoughlin, T. J., L.R.C.P. & S. 1878 (E).
MacMahon, A. D., M.B. 1911 (I).
MacMahon, F. I., L.A.H. 1919 (I).
McManus, George, L.R.C.P. & S. 1869 (I).
McMullen, John, M.B. 1893 (I).
McMurray, Wahab, M.D. 1881 (I).
Macnamara, D. W., M.B. 1918 (I).
Macnamara, G. F., L.A.H. 1884 (I).
Macnamara, G. U., L.R.C.S. 1871 (I).
Macnamara, Matthew, L.R.C.S. 1883 (I).
McNaughton, Mrs. M. H., M.B. 1899 (E).
Macrae, Donald, M.R.C.S. 1908 (E).
McReddie, P. G., M.B. 1891 (E).
McRitchie, Philip, M.R.C.S. 1913 (E).
MacSweeney, J. A., L.R.C.P. & S. 1917 (I).
Madden, J. A., M.B. 1919 (I).
Madders, George, L.A.H. 1885 (I).
Madill, D. G., M.B. 1908 (I).
Maguire, Charles, M.B. 1920 (I).
Maguire, Daniel, L.F.P.S. 1876 (I).
Maguire, Joseph, L.R.C.S. 1886 (I).
Maguire, Stanislaus, L.R.C.S. 1876 (I).
Maguire, T. J. R., M.B. 1912 (I).
Major, H. M., M.R.C.S. 1903 (E).
Makar, Naguib, M.R.C.S. 1920 (E).
Makhijani, G. T., L.R.C.P. & S. 1915 (E).
Malaher, Bruce, L.R.C.P. & S. 1913 (I).
Malcolm-Gasper, R. J. T., L.R.C.P. & S. 1916 (E).
Malik, L. A., M.R.C.S. 1916 (E).
Malkani, S. S., M.R.C.S. 1916 (E).
Mallinick, Samuel, M.R.C.S. 1915 (E).
Mangan, Bartholomew, M.D. 1883 (I).
Mankar, B. S., L.S.A. 1897 (E).
Manker, V. L., L.R.C.P. & S. 1898 (E).
Manuel, Alexander, M.R.C.S. 1905 (E).
Marrack, G. C., M.R.C.S. 1898 (E).
Marriott, H. T., L.R.C.P. 1886 (E).
Marriott, Miss Phyllis, M.B. 1917 (E).
Marry, L. J. A., L.S.A. 1902 (E).
Marshall, F. E., L.S.A. 1896 (E).
Marshall, Joseph, M.B. 1876 (I).
Martin, H. P., M.R.C.S. 1905 (E).
Martin, J. H., M.B. 1900 (E).
Martin, J. M., M.R.C.S. 1899 (E).
Martyn, Ernest, M.B. 1881 (E).
Martyn, George, L.S.A. 1892 (E).
Mascarenhas, L. C., L.R.C.P. & S. 1912 (E).
Mason, H. W., L.A.H. 1902 (I).
Mason, R. P. S., *M.C.*, M.R.C.S. 1915 (E).
Massey, David, L.R.C.P. & S. 1898 (I).
Mathew, C. P., M.R.C.S. 1883 (E).
Mathews, F. W., L.R.C.P. & S. 1908 (I).
Mathews, V. G., L.A.H. 1908 (I).
Mathie, J. P., L.R.C.P. & S. 1916 (E).
Mathur, K. P., M.R.C.S. 1911 (E).
Mattei, Charles, L.R.C.P. & S. 1898 (E).
Matthai, P. M., L.R.C.P. & S. 1897 (E).
Matthews, T. M., L.R.C.P. & S. 1920 (I).
Maudsley, Henry, C.M.G., M.R.C.S. 1880 (E).
Maunsell, H. E., M.B., 1867 (I).
May, W. J., L.M.S.S.A. 1916 (E).
Mayberry, F. G., M.B. 1870 (I).
Maye, John, M.R.C.S. 1882 (E).
Mayer, C. A. L., M.B. 1906 (E).
Mayer, W. L., M.R.C.S. 1871 (E).
Meade, Edward, M.R.C.S. 1861 (I).
Meaden, C. A., M.R.C.S. 1909 (E).
Mellor, Thomas, L.S.A. 1878 (E).
Mellotte, J. H., M.B. 1920 (I).
Menage, L. M. J., M.R.C.S. 1913 (E).
Menon, A. V. R., M.R.C.S. 1919 (E).
Mensa Annan, Tete, M.R.C.S. 1920 (E).
Merrifield, S. S., M.R.C.S. 1883 (E).
Michell, Henry S., M.R.C.S. 1876 (E).
Michod, F. A. H., M.R.C.S. 1897 (E).
Miller, D. J., M.D. 1909 (I).
Miller, E. J., L.S.A. 1902 (E).
Mills, F. A., M.B. 1898 (E).
Milner, C. W., M.R.C.S. 1893 (E).
Milner, W. A., M.R.C.S. 1906 (E).
Milton, A. R. O., M.R.C.S. 1892 (E).
Mistri, K. H., L.R.C.S. 1878 (E).
Mitchell, Edward, L.R.C.P. & S. 1920 (I).
Mitchell, J. T., M.B. 1879 (E).
Mitchell, John, L.R.C.P. & S. 1910 (I).
Mitra, Asutosh, L.R.C.P. & S. 1883 (E).
Mitra, B. M., M.R.C.S. 1914 (E).
Mittra, Dhanaindranatha, L.R.C.P. & S. 1899 (E).
Moftah, S. G., M.R.C.S. 1915 (E).
Molesworth, R. E., M.R.C.S. 1884 (E).
Molina, Ferdinand, M.R.C.S. 1915 (E).
Monckton, F. A., M.R.C.S. 1857 (E).
Monckton, H. H., L.S.A. 1897 (E).
Montgomery, Edward, M.B. 1891 (I).
Montgomery, H. H., L.R.C.P. & S. 19 (I).
Moore, Alfred, M.B. 1892 (I).
Moore, A. R., L.R.C.P. & S. 1892 (I).
Moore, D. G. F., M.R.C.S. 1920 (E).
Moore, F. J., L.R.C.P. & S. 1902 (I).
Moore, G. S., L.S.A. 1899 (E).
Moore, H. E., M.B. 1904 (E).
Moore, J. B., L.K.Q.C.P. 1887 (I).
Moore, J. P., M.B. 1909 (I).
Moore, Walter, M.R.C.S. 1866 (E).
Moorhouse, B. M., M.B. 1883 (E).
Moran, T. F., L.R.C.P. & S. 1915 (I).
Moray-Lawrence, Miss J. M., M.B. 19 (E).
Moreton, Frederick, M.R.C.S. 1894 (E).
Moreton, J. S., M.R.C.S. 1882 (E).
Morgan, C. P., L.S.A. 1891 (E).
Morgan, D. L., M.R.C.S. 1901 (E).
Morgan, H. L., M.R.C.S. 1907 (E).
Morgan, Mrs. M. E., M.B. 1913 (E).
Morgan, Thomas, M.R.C.S. 1902 (E).
Morley, Arthur, L.R.C.P. & S. 1885 (E).
Morrell, C. C., L.S.A. 1907 (E).
Morrin, F. J., M.B. 1915 (I).
Morris, E. W., M.R.C.S. 1887 (E).
Morris, Jonas, M.R.C.S. 1905 (E).
Morrow, Robert, M.B. 1884 (I).
Mortada, Ismail, M.R.C.S. 1915 (E).
Morton, F. W. W., L.R.C.P. & S. 1880 (
Moses, O. St. J., M.B. 1896 (E).
Moss, Miss E. M. N., M.B. 1913 (E).
Mosse, C. G. T., M.R.C.S. 1915 (E).
Mostertz, Julius, L.S.A. 1893 (E).
Moxon, A. H., M.R.C.S. 1886 (E).
Mudd, F. B., M.R.C.S. 1897 (E).
Mullins, G. L., M.B. 1887 (I).
Munro, A. W., M.B. 1883 (E).
Murie, James, M.D. 1857 (E).
Murnane, Miss H. M., M.B. 1920 (I).
Murnane, J. I., M.B. 1913 (I).
Murnane, P. J., M.B. 1918 (I).
Murphy, A. E., L.R.C.S. 1886 (I).
Murphy, H. A. J. S., L.Med.L.S. 1900 (
Murphy, J. J., M.R.C.S. 1916 (E).
Murphy, L. C. E., L.R.C.P. & S. 1903 (
Murphy, Miss M. A., M.B. 1912 (E).
Murphy, P. F., M.B. 1911 (I).
Murray, A. H., L.R.C.S. 1880 (I).
Murray, Cyril, L.R.C.P. & S. 1917 (I).
Murray, Miss J. R., M.B. 1906 (I).
Murray, Joseph, L.R.C.P. & S. 1902 (
Murray, Thomas, L.R.C.P. & S. 1910 (
Muttu Kumaru, K. V., M.B. 1915 (E).
Myerson, M. C., L.R.C.P. & S. 1918 (I).

Nagle, J. J., M.D. 1885 (I).
Nairn, A. B., L.R.C.P. & S. 1900 (E).
Nankivell, Frank, M.B. 1875 (E).
Naoroji, M. A. D., M.B. 1906 (E).
Nariman, B. K., M.B. 1896 (E).
Naz, J. B. C. O., M.R.C.S. 1899 (E).
Neill, Charles, M.B. 1894 (E).
Neligan, A. R., M.R.C.S. 1903 (E).
Neville, Thomas, L.R.C.P. & S. 1898 (E
Newman, C. D., M.B. 1920 (E).
Newmark, Solomon, L.R.C.P. & S. 19 (E).
Nicholls, John M., M.R.C.S. 1880 (E).
Nicholson, Gerald, M.R.C.S. 1881 (E).
Nicholson, John, M.R.C.S. 1862 (E).
Nicol, Wm. P., M.R.C.S. 1896 (E).
Nicol, Wm. Robert, L.S.A. 1891 (E).
Nielsen, Fredk. W., L.S.A. 1885 (E).
Nihill, John E., M.R.C.S. 1886 (E).
Nissim, Edward, M.R.C.S. 1918 (E).
Noad, Ernest, M.R.C.S. 1884 (E).
Nolan, Harold, M.B. 1896 (E).
Nolan, Herbert F., L.R.C.P. & S. 1894 (I
Noonan, Patrick, L.R.C.P. & S. 1892 (E
Norman, Cuthbert E. R., L.A.H. 1912 (E
Norrington, H. L. W., *D.S.O.*, M.R.C. 1897 (E).
Norris, Miss Nannette, M.B. 1921 (I).
Nortje, Peter Le F., M.B. 1911 (E).
Nottingham, Wm. A. J., L.S.A. 1885 (E
Noyes, Alexr. W. F., L.S.A. 1885 (E).
Nuthall, Robert L. S., M.R.C.S. 1890 (E

Oates, James C., M.R.C.S. 1900 (E).
O'Brien, James V., L.R.C.P. & S. 191 (I).
O'Brien, Michael F., L.R.C.P. & S. 191 (I).
O'Brien, Michael J., L.R.C.P. & S. 189 (I).
O'Carroll, Martin, L.Med.U.Dubl. 187 (I).
O'Connell, Patrick Joseph, L.R.C.P. & 1918 (I).
O'Connor, James, M.B., 1914 (I).
O'Connor, Matthew J., M.B. 1919 (I).
O'Connor, Wm. M. J., M.B. 1914 (I).
O'Donnell, John, M.B., 1892 (I).
O'Donnell, Thomas M., L.R.C.S. 1883 (I
O'Donoghue, Henry V., L.R.C.P. & 1914 (I).
O'Donovan, Daniel, M.R.C.S. 1919 (E).

Donovan, Louis J., L.R.C.P. & S. 1912 I).
Donovan, Wm. J., *O.B.E.*, M.R.C.S. 1909 (E).
Driscoll, John A., L.R.C.P. & S. 1914 I).
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Dwyer, Peter, L.R.C.P. & S. 1888 (I).
Farrell, Ignatius, L.K.Q.C.P. 1860 (I).
Farrell, John W., L.R.C.P. & S. 1908 I).
Flynn, Jerome, M.B. 1913 (I).
Grady, John F. G. K., M.B. 1921 (I).
Grady, Patrick J., M.B. 1913 (I).
Hagan, Charles, M.B. 1914 (E).
Halloran, Miss A. M. K., M.B. 1917 (I).
Keefe, Edward J., M.B. 1914 (I).
Kelly, James J., M.B. 1909 (I).
Kelly, John J., L.R.C.P. & S. 1912 (I).
O'Leary, James, L.R.C.P. & S. 1900 (I).
O'Leary, Miss M. M. A., M.B. 1915 (I).
Oliver, A. C., L.S.A. 1901 (E).
Oliver, Charles H., L.R.C.P. & S. 1911 (I).
Olivey, Wm. J., M.R.C.S. 1891 (E).
Olsen, Alfred B., M.R.C.S. 1901 (E).
O'Malley, Michael, M.D. 1868 (I).
Omar, Mustafa A., M.R.C.S. 1916 (E).
O'Meara, Daniel J. P., M.R.C.S. 1920 (E).
O'Meara, Patrick M., M.B. 1897 (I).
O'Neill, John G., M.B. 1878 (I).
O'Neill, Wm., M.B. 1914 (I).
O'Reilly, Miss Alice, M.R.C.S. 1916 (E).
O'Reilly, Arthur E., L.R.C.P. & S. 1900 (I).
O'Reilly, Charles J., *D.S.O.*, *M.C.*, M.B. 1913 (I).
Orford, Miss Florence, L.R.C.P. & S. 1888 (E).
O'Riordan, George E., M.B. 1919 (I).
Ormsby, George H., L.K.Q.C.P. 1869 (I).
Orr, Andrew W., M.B. 1887 (I).
Orr, Frederic L., M.B. 1890 (E).
Osburne, John C., M.B. 1913 (I).
O'Shaughnessy, Michael, L.R.C.P. & S. 1890 (E).
O'Shaughnessy, P. J. B., L.R.C.S. 1878 (I).
O'Sullivan, C. F. X., M.B. 1907 (I).
O'Sullivan, David, L.R.C.P. & S. 1909 (I).
O'Sullivan, Edward F., M.D. 1897 (I).
O'Sullivan, James J., L.R.C.P. & S. 1921 (I).
O'Sullivan, Joseph E., M.B. 1913 (I).
Othman, Ahmed, M.R.C.S. 1920 (E).
Owens, Edward M., M.R.C.S. 1866 (E).
Owens, Henry E., M.B. 1916 (I).

TERNATIONAL UNIFORMITY IN PHARMACOPŒIAL PREPARATIONS.

SOME NEW SUGGESTIONS.

THE problem of an International Pharmacopœia s discussed at the general assembly of the Intertional Pharmaceutical Federation, which met in ndon recently at the same time as the British armaceutical Conference.

The subject is not a new one, and we may recall it already, in 1877, at the Fifth International dical Congress of Geneva, following a report from . Gilles, it was agreed that uniformity both in the menclature and the composition of medicaments s highly desirable. A committee was appointed to dy the subject and to inquire into the matter of universal codex which had been prepared by the ciété de Pharmacie, of Paris. At the next Congress msterdam, 1879) this committee was enlarged, and was decided to accept the French draft as a basis l have it published. The French formulary, wever, passed through many vicissitudes and was ver set in print. In 1881 the Seventh Medical ngress met in London at the same time as the th Pharmaceutical Congress. They had a joint eting, and after a long discussion two committees re appointed, one by each body, to collaborate and pare a restricted formulary that would receive eral approval. The Pharmaceutical Committee blished the result of its labours in 1885 (Sixth ngress, Brussels), but it remained a dead letter.

Once more, at the Moscow Medical Congress of 1897, question was raised and a proposal put forward to l a Government that would give its support to undertaking. During the year following the ussels Academy of Medicine requested the Belgian vernment to convene a representative interional conference for the purpose of standardising ent galenicals. The conference met in 1902 and lded the first practical result in the form of an ernational agreement regulating the strength of ne 40 poisonous preparations. Since then very le advance has been made, but the International armaceutical Federation has recently decided to ew the attempts.

Prof. van Itallie (Leiden), in his presidential ress to the Federation, remarked that the Brussels eement, though an excellent beginning, has become iquated and, like every national pharmacopœia, uires corrections and extension. As President of Pharmacopœia Committee of Netherlands, he fully aware of the large amount of work necessary its revision. He had, therefore, proposed last r that an international secretariat should be rusted with the task of collecting the data needed bringing up to date national pharmacopœias, s promoting uniformity. A committee of chemists, rmacologists, clinicists, and serologists could rwards compile an international pharmacopœia restricted scope, containing only the more import- drugs and their preparations, together with accurate hods of testing. The need for national medicines ıld still exist, but every country would be free to have its own additional formulæ. In most places we find already side by side an official pharmacopœia and a national formulary.

Dr. J. J. Hofman (Secretary of the I.P.F.) stated that the Belgian Government had been requested to bring together a second international conference in order to discuss the institution of a central pharmacopœial secretariat as outlined by Prof. van Itallie. The Belgian Government had not yet signified its acquiescence, and if it should refuse another Government will have to be approached.

A slightly different proposal was put forward by a group of British pharmacists and analysts, who communicated to the Conference a number of monographs dealing with the international standardisation of pharmacopœial preparations. Mr. V. Cofman, B.Sc., in introducing these papers, explained that they had put aside, for the time being, the ambitious aim of an international pharmacopœia. The immediate aim was to attain uniformity in the case of the really important drugs, so that potent preparations which had a common name in different countries should also have the same composition. The importance of this step was too obvious to need demonstration; everybody was agreed on that point. Of greater importance was the method chosen to attack the problem. In their opinion it was necessary to prepare the ground by collecting in a convenient form the data on which the international conference for unification, when it eventually does meet, will have to base its decisions. A beginning in this field had been made. Each monograph submitted to the Conference dealt exhaustively with a single drug and its preparations giving comparative tables of the formulæ and methods adopted by all existing pharmacopœias, together with criticisms and suggestions as to which appears the most suitable for universal use.

Mr. C. T. Bennett, B.Sc., F.I.C. (Chief Chemist, Wright, Layman and Umney), who had investigated the cinchona preparations and the methods of assay of various pharmacopœias, came to the following conclusions: (1) that the bark should be required to contain 6 to 8 per cent. of total alkaloids; (2) that a liquid extract should be prepared by percolation with 70 per cent. alcohol, hydrochloric acid and glycerine being added to prevent precipitation (its alkaloidal content should be 5 per cent.); (3) a simple tincture (1 per cent. alkaloids) should be prepared with 70 per cent. alcohol.

Mr. H. B. Stevens, O.B.E., F.I.C. (Director, John Bell, Hills and Lucas), dealt in his monograph with the opium preparations, and advised that: (1) in expressing the percentage of alkaloid present the morphine should always be calculated as anhydrous; (2) the extract of opium should contain 20 per cent. of anhydrous morphine, sugar of milk being used as diluent, if necessary; (3) the tincture of opium be made with 45 per cent. alcohol, 70 per cent. being unnecessarily high; (4) the formula for Dover's powder should be: opium 1, ipecac. 1, sugar of milk 8.

Mr. A. J. Jones, Ph.C. (Research Dept., Evans, Lescher and Webb) reviewed the preparations of belladonna, showing the present variations in the formulæ and methods of testing. The author suggests that a soft standardised extract should be retained, and describes the analytical methods which appear most reliable for determining the activity of the drug.

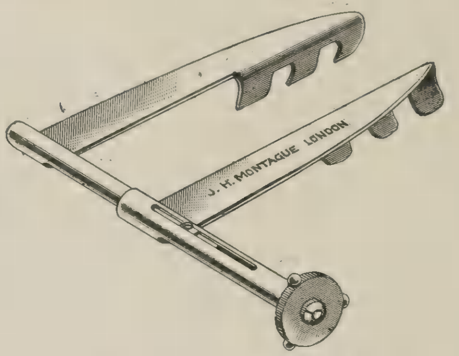
Messrs. J. Cofman-Nicoresti and S. B. Tallantyre, B.Sc., A.R.C.S. (City Laboratories) gave a survey and critical description of the quillaia preparations, while a study of colchicum galenicals from an international standpoint came from Misses E. Hooper, B.Sc., F.I.C., and K. M. King, Ph.C. (Principals of the School of Pharmacy for Women.)

It was finally recommended that the faculties of medicine and pharmacy of every country should be advised to continue and extend this essential preliminary work, and when all the information needed had been collected the Health Department of the League of Nations should be asked to bring together a conference of those concerned, in order to decide which formulæ and methods are most suitable for universal use. The assembly agreed that the permanent committee should consider the proposal and take the necessary steps accordingly.

New Inventions.

A LAMINECTOMY RETRACTOR.

One of the difficulties in performing a laminectomy operation is to obtain adequate retraction of the erector spinæ muscles on each side. If the muscles are peeled away on either side and a self-retaining retractor inserted, an excellent view of the laminæ is obtained, and troublesome hæmorrhage is avoided. The retractor consists of two stout steel blades with wide base and tapering towards the top. The inner edges of the blades have three curved hooks which are inserted under the erector spinæ muscles when the retractor is closed. The extension of the retractor blades are manipulated by a quick travelling screw revolving in a telescopic steel tube. On rotating a wheel at the opposite end of the tube, the blades will open to 5 inches. I have found the retractor a very useful instrument; the adjustment is good.



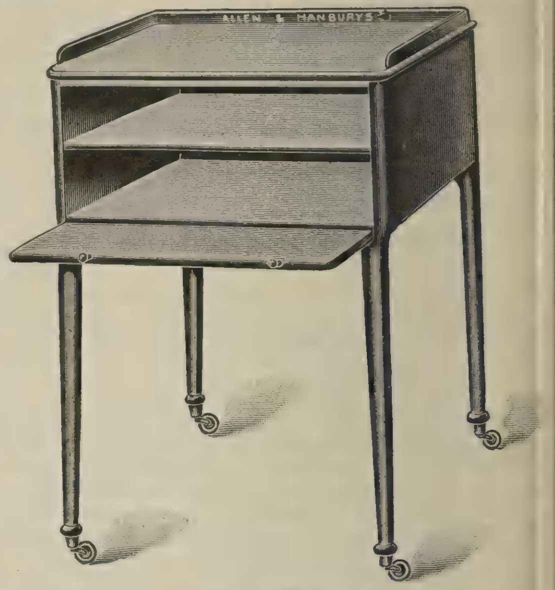
Messrs. J. H. Montague, of 69, New Bond-street, London, W., have made the retractor here described to my design.

C. P. G. Wakeley, F.R.C.S. Eng.

Devonshire-place, W.

INVALID'S BEDSIDE TABLE.

This table has been designed to add to the comfort of those patients who are not helpless, but have to spend many hours in bed. The ordinary table soon becomes crowded with the patient's effects, and everything is displayed to anyone entering the room. The table illustrated is in three tiers: the top and two compartments, and in addition there is a sliding shelf which can be pulled across the bed. It takes up less room than the ordinary small table in use for the purpose, and it has the following advantages: The two compartments w
hold all the personal belongings, such as bool
writing materials, and so on, which any one is likely
need, and these are in sight and control only of t
patient, and are always easy to get at. Spit cu
medicine bottles, and so on, are kept out of sight
everyone except the occupant of the bed. T
sliding shelf pulls over the bed for meals or for writi
upon, and there is no need for bed-tables of any kin



The table runs on easy castors, and a slight push w
place it in any desired position. All corners a
rounded. It can be made of any hard wood, a
polished so that it forms an attractive feature in
sick-room.

The table is made by Messrs. Allen and Hanbury
Ltd., Wigmore-street, London, W. 1.

A. Campbell Stark, M.B. Lond.

Wanstead Park, E.

East Sussex Hospital.—On July 23rd Viscou
Goschen presided at the annual meeting of the recent
opened East Sussex Hospital. In the course of his spee
Lord Goschen spoke of the anxiety on his own part and th
of his audience to preserve the system of voluntary hospita
and of the spirit of voluntary service and self-sacrifi
which, he was convinced, was needed at the present d
perhaps more than ever, and which beside assisting hospita
would assist the country during times of anxiety a
unrest. The greater the advance in hospitals the greater mu
the expense be, but a business man would look at the retu
the country was getting for this insurance against a
population. Lord Goschen recalled that the foundation-sto
of the hospital was laid in 1914, a fortnight before the outbre
of war. The hospital had, however, only just been complete
The annual meeting this year had been delayed to allow of
being held in the new building. The annual report, of cour
referred to the work at the old building at White Roc
It showed that the number of in-patients during the year w
1011, and new out-patients (including 1171 casualty cas
4681. The general income had been well maintained, the
being an increase of £483 upon the ordinary income, the tot
being £13,817. The annual subscriptions showed an increa
of £273, the total received from subscribers being £2326. T
ordinary expenditure showed a considerable drop; a
overdraft at the bank had been liquidated, and the balan
sheet showed a deficit of £145 18*s*. 5*d*. The reserve was p
at £14,419. The report chronicled the purchase of houses f
a nurses' home, the gift of the chairman of the committe
Major W. H. Mullens, J.P. In recording the resignation
Dr. C. Christopherson, senior surgeon, owing to illness, aft
a period of 29 years' service, the report stated that "It
largely due to his ability, influence, and personality that t
East Sussex has obtained its reputation for efficiency."
the discussion on the report it was said that roughly anoth
£10,000 was needed to complete the work, with an addition
sum of £1500 or £2000 for furniture and equipment.

THE LANCET.

LONDON: SATURDAY, AUGUST 11, 1923.

EXOPHTHALMIC GOITRE.

THE present issue of THE LANCET contains two rticles on the treatment of exophthalmic goitre which re to some extent complementary. In one Dr. G. R. urray describes the treatment of the disease by nedical measures; in the other Mr. A. J. Walton leals with it rather from the surgical standpoint. The rticles, however, although complementary, exhibit in remarkable way the necessity for intimate coöperaion between physician and surgeon in treating this ondition. An immense amount of thought has been iven to the attempt to elucidate the ætiology and reatment of the disease, and the literature of the ubject is profuse; but it must be confessed that the roblem of ætiology is still unsolved and that treat- ent, whether medical or surgical, remains almost xclusively symptomatic. But with admission of is fact and of its corollary that surgery may eventu- lly come to occupy a very minor place in the treat- ent of exophthalmic goitre, yet it must also be granted at by far the most striking advances during the last 5 years have been made along the lines of surgical tervention. The foundations of the requisite know- dge and experience have been carefully and painfully id by the pioneer work of Dunhill in Australia, Crile and the Mayo brothers in America, and of erry and Walton in this country, and the results ve been gratifying to surgeons and patients ike. Surgery in the course of its advance has met ith much healthful opposition, but it has proved its orth; and this claim is substantiated by the attitude an authority such as Sir Hector Mackenzie, who, ving been in full opposition ten years ago, is now one the convinced supporters of surgical treatment.

Even apart from the relative claims of medicine or rgery as regards ultimate success, one of the chief ctors lending its weight in favour of surgery is the mparative rapidity with which improvement is tained. The period of the patient's disability is easured by months rather than by years, and the radoxical fact remains that surgical treatment, hough symptomatic, produces a large proportion apparent cures. These results have, however, only en obtained by the closest attention to every detail the procedure. There can be few surgical operations quiring more careful preparation, closer watching the operative conditions, including even the state the weather, or more precise operative technique. l these points receive attention in Mr. Walton's ture, though the limits of a single article, while not venting him from considering the disease from widest possible point of view, have not permitted n to enter fully into the more technical details. position to surgical treatment was formerly based gely on the operative mortality, but this has w been reduced to a point at which statistics cease ave much importance. It may be assumed that the rative mortality is now in expert hands not greater n 5 per cent. A claim made by any individual rator to a reduction to a figure below 3 per cent. sibly depends upon whether he is operating with iew to favourable operative statistics or solely for welfare of the individual patient. When a risky ration forms the patient's only hope of recovery at moral courage may be needed by the surgeon in forming the decision whether the operation is justifiable or not. However this may be, there is a very general agreement among surgeons and physicians that medical treatment should be tried for at least six months in almost every case before any operation is performed. This six months' trial is necessary both as a test of the value of drugs and general measures in each case, and as a preparation for operation if this is eventually to be advised.

On these points controversy is now almost at an end. Difference of opinion still exists, however, regarding the value of treatment by X rays. Dr. Murray regards this as "one of the most reliable means" of treatment we possess; Mr. Walton has found its use "very unsatisfactory," and supports the view that radiation has little or no effect on the thyroid by the observation that he has found no appreciable change in the thyroid of those cases that he has operated upon after X rays had been tried. The general trend of opinion seems to be against a belief in the efficacy of X rays, but this is a matter upon which no final opinion can be expressed. It has long been observed that the changes in the thyroid are accompanied by an enlargement of the thymus gland; this was noticed and recorded 100 years ago by Sir Astley Cooper. But little attention has been given as yet to the effects of radiation upon the thymus which, consisting as it does chiefly of lymphoid cells, might be expected to be more readily affected than the thyroid itself. The whole problem of exophthalmic goitre is a fascinating one, whether regarded from the ætiological, pathological, medical, or surgical standpoint. Every one of these aspects may undergo a sudden and complete change in the near future. The articles now published will at any rate mark the place which had been arrived at in the year 1923.

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PHYSICAL RESEMBLANCE IN CASES OF DISPUTED PARENTAGE.

IN the Russell *v.* Russell divorce proceedings, which seem likely to give the House of Lords the opportunity of dealing with more than one point of medico-legal interest, the child was brought into court, and the jury was invited to draw an inference as to its paternity from its resemblance or non-resemblance to photographs of the petitioner taken at a similarly early age. "I cannot stop your considering this question of likeness," said Mr. Justice Hill to the jury, "but I myself regard it as a dangerous guide." The fancifulness of family opinions on suggestions of family likeness is indeed notorious, and the fallibility of partisan belief was manifested in the Russell case, when the respondent was incautiously ready, under a confusing cross-examination, to find a resemblance between her baby and the photograph of a total stranger. Lady Ampthill, the petitioner's mother, declared that the child in court bore no resemblance to her son, but negative evidence in itself is of but slight assistance. Likeness may be some aid in establishing paternity; unlikeness is none. It may be possible to draw attention to an aggregate of similarities—the colouring of the eyes or the hair, the shape of the ear, and so on; but evidence of this kind in courts of law is hardly developed with as much certitude as evidence of identity in hand-writing—a study in which expert witnesses have come sadly to grief before now. General likeness of feature is not uncommonly relied upon in affiliation proceedings, wherein magistrates, we believe, allow it a certain minor corroborative value in a rough and ready sort of way. One would suppose it was an especially dangerous guide in such cases, since the woman is usually making her application to the court at a time when the infant is of so tender an age that immaturity of feature must obscure observation and discount confidence. Much more significant than mere resemblance of feature would be any evidence of some definite hereditary characteristic. If the study of blood-groups yields as yet no very positive result for medico-legal purposes,[1] the recurrence of a malformation might assist decision. Twenty years ago, in a Jamaican case, polydactylism was relied on as an inference of family descent.[2] Racial characteristics would also be of value. A coloured skin and woolly hair would be by no means negligible if there were an allegation of negro paternity. Even in Scotland, where this kind of evidence of physical resemblance is not normally permitted, notice has been taken of such points; for instance, in a case 100 years ago a white man was held not to be the father of a white woman's child, the child being a mulatto.

Those who are interested in this point of medical jurisprudence will find a singularly lucid and informing article by Prof. Courtney Kenny in our learned contemporary the *Law Quarterly Review*, entitled Resemblance as Evidence of Consanguinity, wherein these matters are admirably set forth. The writer traces the doctrine of the acceptability of such evidence back to the famous Douglas Cause of 1769, the most sensational litigation of its time, a topic on which Boswell wrote a pamphlet which he could never induce Dr. Johnson to read. In the House of Lords, Lord Mansfield, enlarging upon the greater scope for drawing helpful inferences from physical likeness amongst human beings than in the rest of the animal world, said "a man might survey 10,000 people before he saw two faces perfectly alike," while Camden, then Lord Chancellor, in language more rhetorical than judicial, spoke of the physical likeness in the case as "an impression stamped by God himself to prove the legitimacy of the child." In 1915, it may be recalled, evidence of this kind was tendered in the Slingsby case, when an action was brought in the name of a boy of 4 years of age, asking that he be declared the lawful child of Commander Slingsby, who supported his claim as against certain relatives who were hostile to it. The judge, Sir Bargrave Deane, then took the unusual course of obtaining the services of Sir George Frampton, the well-known sculptor, to assist him in the comparison of the features. The judgment, which was in favour of the boy's legitimacy, dwelt upon his extraordinary likeness to Commander Slingsby. Both the Court of Appeal and the House of Lords were prepared to allow weight to the judge's own opinion of the likeness, though the calling in of the sculptor, who had neither been sworn as an expert witness nor formally appointed as an assessor, was thought irregular.

Thus, after a long series of decisions it has become clear that the English law, cautiously and for what the evidence may be worth, allows testimony of physical resemblance in disputes about parentage. In a well-known text-book of high authority—Taylor on "Evidence"—it is suggested that this legal position is automatically reached as soon as it is proved to the court as a matter of science that children are apt to inherit the features of their parents. In criticising this statement Prof. Kenny points out that there is no case on record wherein the courts have required any such preliminary proof of the general principle. Judicial ignorance, nowadays perhaps less overworked than formerly, is not so blindfold as that. As Prof. Kenny observes, "Tribunals sufficiently familiar with the course of nature to be able to take judicial notice that a woman of 70 will have no more children, and that a husband's non-access for a year disproves the legitimacy of his wife's child, will need no aid from scientific witnesses to assure them that 'Like is apt to beget like.'"

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[1] See Blood-groups and Paternity, The Lancet, 1922, ii., 285.

[2] The Lancet, 1903, i., 822.

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THE MECHANISM OF ALIMENTARY SECRETION.

A glance at recent work in physiology reveals a number of highly critical publications on the subject of alimentary hormones. After the introduction of gastric and pancreatic secretin some years ago the hormonic theory of secretory stimulation seemed to take an assured position in physiology, at least in this country. Very little work on similar lines appeared until quite recently; perhaps the work of Ivy should be mentioned first, since he repeated a great deal of Edkins's work, which he failed to confirm, and came to the conclusion that gastric secretin was not the normal method of producing a secretion from the stomach. With regard to the question of pancreatic secretin, there is abundant confirmation of the fact that an injection of an extract of duodenal mucosa does cause a secretion from the pancreas. The doubt arises as to whether this is the normal mechanism of pancreatic secretion, for there seems to be a gap in the logic at this point. It will be remembered that Bayliss and Starling stated that many substances were capable of producing secretin, but that HCl was by far the most potent and important. Damade and de Grailly, in a paper on duodenal tubage read recently before the Société de Biologie,[1] give the results obtained by the injection of substances directly into the duodenum. They passed a duodenal tube on the starving subject, and aspirated as much fluid from the duodenum as possible. They then injected various test fluids into the duodenum through the tube, and withdrew specimens of the resulting secretion at quarter-hourly intervals. These specimens were measured and were analysed for bile, lipase, trypsin and titratable alkalinity. The observers experimented with milk, skimmed milk, olive oil, and a solution containing HCl and peptone. They found that olive oil and milk increased the volume and the enzyme content to a very marked extent, whilst hydrochloric acid appeared to be without action. In some of the experiments olive oil doubled both the volume and the concentration of the constituents of the secretion. The conclusions to be drawn from the experiments is in direct opposition to the popular conception of the secretin hypothesis, which holds hydrochloric acid to be far the most powerful of secretin producers. The problem of pancreatic stimulation in achlorhydria is brought to mind. Similar results were obtained by Bennett and Dodds, who used the respiratory method of recording secretion below the pylorus. These workers showed that there was no difference in the effect on pancreatic secretion when acid or alkaline fluids were introduced into the duodenum. Unfortunately, it is practically impossible to devise any method of investigating secretion below the pylorus in which the sources of error are fairly low. Direct tubage of the duodenum is open to more fallacies than tubage of the stomach, since the contents at any particular moment are influenced by so many rapidly varying factors—namely, entrance of stomach contents, bile, pancreatic and duodenal secretions, together with the more or less rapid passage of the resultant mixture through the duodenum. The last ten years have seen considerable advances in the study of human digestion, and as more physiological research is done with normal men as subjects it becomes more and more apparent that a large number of the text-book views on digestion—based on animal work—are quite inapplicable to man.

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[1] Tubage duodénal: rôle de quelques excitants chimiques de la sécrétion duodénale, Comptes Rendus de la Société de Biologie, June, 1923.

Annotations.

"Ne quid nimis."

PRESIDENT HARDING.

THE late President Harding, whose death occurred with tragic suddenness as he was apparently on the high road to recovery from an attack of bronchopneumonia, came of a medical stock. His father, George Tryon Harding, is still in practice at Marion, a township of 29,000 inhabitants in Ohio, where the President was born and brought up. Dr. Harding s now in his seventy-ninth year, having qualified at Cleveland University in 1873. A younger brother of he late President bears his father's name and is in practice at Columbus, a city of 240,000 in the same State; he qualified in 1900 at the Ann Arbor University of Michigan and is a specialist in neurology and psychiatry. It is not fanciful to see in the late President's broad outlook some reflection of the medical atmosphere in his early home life.

INDUSTRY AND HEALTH.

MANY influences are pointed to when reason is sought for the steady improvement which has taken lace since the middle of last century in the health of he nation. Improved sanitation, better housing, ure water-supply, rise in value of real wages with etter feeding, less intemperance, better care of the ndividual and by the individual due to better educa- on—all are credited with their contribution; but here nd there authorities such as Greenwood have stressed he importance of improved conditions of labour rought about partly by natural progress as industrial methods have developed, but more directly by com- liance with our code of factory legislation. Few ersons are in a position to judge of the progress, since ew are familiar with the insides of our great factories. here exists, however, a body of expert inspectors ways at work pressing for and obtaining improve- ments; probably it constitutes the most effective ranch of the public health service. It is formed of wo groups, inspectors of factories and inspectors mines.

We have before us, just published, the annual report the Chief Inspector of Factories,[1] which tells of the ork done during the past year. Signs are reported of turn in the industrial tide and of opportunities being ken to prepare for future development. The tend- ncy continues for larger establishments to increase in umber and size while the smaller workshops get wer—a movement advantageous to improved con- tions of work. The report consists of four chap- rs in which information is given of the more striking ents of the year and of steps taken to administer the w and obtain compliance with the various codes of gulations; then follow three chapters dealing with ecial investigations, one into the dust content of the mosphere of workplaces, another concerned with ysiological costs of different methods of weight- rrying, and the third with dangers from explosions oil-carrying and oil-fuel ships. We note with preciation that the factory department is carrying t such work. The time has gone by when advances industrial legislation can be based upon "a general nsensus of opinion"; the obviously injurious matters e under control. Only by accurate knowledge based careful research can further pronounced progress be ected. The work of Dr. E. L. Middleton is a good stance in point, since he has been able to advance owledge concerning the type and size of dust rticles inhaled and the kinds of symptoms and validity which follow. This knowledge should allow tion to be concentrated upon the most injurious types dust. Somewhat unfortunately for the reader the esentation of Dr. Middleton's research has been vided up; one part appears in the present report and deals with the dust present, the other part, concerned with his clinical findings and physical examinations, has just appeared in a separate report.[2] The reason for this separation is obscure. Dr. E. E. Hewitt's research into weight-lifting is another valuable piece of work. Here is a subject about which much has been said, but little really is known. At last, by appeal to the laboratory and to experiment, the foundations have been laid of useful information as to the energy-cost of labour and to the degree to which this cost can be modified by method.

The work of the medical staff is told of by Dr. T. M. Legge, especially with reference to the control of different forms of industrial poisoning, of which plumbism receives most attention; the cases for the year numbered 247, as compared with 639 in 1902. The international aspect of industrial health is borne evidence to by an inquiry conducted into photo-engraving for the International Labour Office, part of a more general inquiry conducted in several other countries,[3] concerning which it is sufficient to note that the danger from nitrous fumes is recognised and under control in this country.

AN IRISH POOR-LAW HOSPITAL SCHEME.

THE first annual report covering the year ended March 31st, 1923, of the County Galway Board of Health is addressed to the Minister for Local Government, President Cosgrave, who was himself responsible for the order, "Abolish the Unions." Mr. Cosgrave writes in a foreword to the report:

> "It has been well and truly said that kindly care for the poor is the best sign of true civilisation, and, again, that the condition of a nation's poor indicates the character of the national mind. With the coming of Freedom the people of County Galway were quick to realise that, at last, it was in their power to end for ever the contemptuous treatment of the poor resulting from the workhouse system, and they set about inaugurating a new system with energy and zeal. I have great hope that, in County Galway and throughout the Free State, the new schemes, established for the better relief of the poor and the better care of the sick, will be administered prudently and humanely, and that these schemes will win for themselves the confidence of the people. Let us hope that true kindly charity may spring from the good fortune on which, we believe, our country is entering."

The report states at the outset that the whole "workhouse" system was inherently bad and would appear to have been designed to put poverty and misery and vice conveniently out of sight rather than to relieve or comfort or retrieve. A history is given of the ineffectual attempts to amalgamate the unions, beginning in August, 1899, and culminating in the County Council Order of October, 1921, appointing the County Board of Health with instructions to abolish the unions and to set up one central county hospital, one central county home, a home for children and unmarried mothers, and to arrange for the care of other classes of persons chargeable to county rates. The Board of Health worked at high pressure, and within eight weeks, by the middle of December, the unions of County Galway had gone for ever without any sworn inquiries, without any expenditure on evidence, and without even a sealed Order.

The central hospital is located at Galway, the county home at Loughrea, and the Board have made arrangements with the Bon Secour sisters to take charge of the children's home, for which the Glennamaddy Union Buildings have been utilised. Thirty per cent. of the customers of the workhouses disappeared when asked to move, a proportion of whom will probably become recipients of home assistance. Appointments have been made as far as possible from existing staffs, so as to avoid compensation. The claims of 206 disemployed officers have been considered. Much union property has been lost through burning. Home assistance (formerly outdoor relief)

Annual Report of Chief Inspector of Factories for 1922, M. Stationery Office. [Cmd. 1920]. 1923. Pp. 153. 5s.

[2] Report on Grinding of Metals and Cleaning of Castings and the Effects of Dust Inhalation upon the Workers E. C. Macklin and E. L. Middleton. H.M. Stationery Office. 1923.

[3] Dangers to Health in Photo-Engraving, International Labour Review, vol. iii., No. 1, pp. 116–125.

is to be all in kind and not in cash. A medical and surgical staff has been appointed for the hospital. The question of "paying patients" gives trouble, and it is difficult to obtain payment from every patient who is able to pay. The salary of the medical officer of a full dispensary district has been fixed, temporarily, at £300 per annum and of a dispensary midwife at £52. The new county home at Loughrea is an attempt to bring comfort and happiness into the lives of the inmates, who have comfortable dining and recreation rooms and dormitories, games and grounds for pleasant exercise—in fact, a great contrast to the old typical workhouses. The Board are confident that the children's home, placed in charge of the Bon Secour sisters, will prove a valuable addition to the social service machinery of the county, and the necessary reconstruction to put it into an efficient condition is now receiving attention. For harmless lunatics and epileptics the county unit is too small and a provincial institution will be the probable solution. From an economic point of view the changes have resulted in the reduction of the annual demand on the ratepayers from £102,000 (March, 1921) to £59,000 (March, 1924). Economy is not the most important consideration, and the Board claim that, although much requires to be done, they have already achieved a fair measure of success in securing better care for the old and infirm and for the sick, and more kindly thought for the shelter and retrievement of the unfortunate.

The Galway Board of Health have made an energetic start, and all social reformers must heartily wish them success. It may be that just as our farmers go to Ireland to learn about coöperation we may shortly be sending deputations there to learn how to deal with the long overdue changes needed in our Poor-law system.

SPLENIC ANÆMIA.

Dr. William C. Chaney[1] has devoted his thesis for the degree of master of science in medicine at the University of Minnesota to a clinical and pathological study of anæmia based on 69 cases in which splenectomy was performed at the Mayo Clinic from Nov. 14th, 1905, to Sept. 1st, 1920. Allusion to this series was made by Dr. W. J. Mayo at the recent congress of the International Society of Surgery. The average age of the patients was 33 years, the youngest being 2½ and the oldest 69. The distribution was about equal in both sexes, 36 being males and 33 females. There was apparently no familial tendency to the disease. The most frequent symptoms were enlargement of the spleen and a mass in the left side of the abdomen (29 cases), gastric hæmorrhage (20 cases), and weakness (19 cases). Abdominal pain was rarely mentioned as the chief complaint, but 32 patients gave a history of such attacks at some stage of the disease. In many instances the pain was probably due to perisplenitis, but in some cases it was due to other causes, such as gall-stones or chronic appendicitis. With a single exception in which it could not be felt owing to the presence of ascites, the spleen was palpable in every case, its average weight being 1015 g. Its relative position in the abdomen was preserved in spite of its progressive enlargement. On operation 26 patients were found to have enlarged livers and 30 definite cirrhosis of the liver, in only 13 of which the liver was larger than normal. The size of the liver did not seem to bear any relation to the size and weight of the spleen. Ascites was present in 24 cases, 23 of which had cirrhosis of the liver. In the remaining case the liver was enlarged but apparently not cirrhotic. The average red-cell count in the 69 cases was 3,700,000, the hæmoglobin 53 per cent., and the leucocytes 4900. The coagulation time and the fragility test were normal and the Wassermann reaction, which was performed in 60 cases, was negative. A composite chart of the leucocyte count showed that there was an initial rise of the leucocytes immediately after the operation, and that the number gradually increased up to 75 to 100 days after the operation. Lymphocytosis was not characteristic of this series. The highest mortality occurred within 40 days of the operation, during which period there were 12 deaths, 7 of which were in cases with marked hepatic cirrhosis. The principal pathological findings were as follows: On naked-eye examination fibrosis was very evident and the trabeculæ especially prominent. The degree of fibrosis of the reticulum seemed to vary with the amount of arterio-sclerosis, but there was no evidence to show that the fibrosis originated in or around the vessel walls. The amount of lymphoid tissue was usually below normal. The number and size of the Malpighian corpuscles were found to decrease as the size and weight of the spleen increased.

NON-TRAUMATIC DIAPHRAGMATIC HERNIA.

IN a paper read before the annual meeting of the Radiological Society of North America Dr. E. H. Kessler,[1] of St. Louis, remarks that while congenital diaphragmatic hernia is rare, hernia of the diaphragm caused by trauma, such as crushing injuries, gunshot wounds, and injury by the aspirating needle is not infrequent. In the course of two years he has met with four cases without any known history of injury. Two of the patients had been referred to him for gastro-intestinal examination on account of gastro-intestinal disturbance, the third for the confirmation of a diagnosis of pneumothorax, and the fourth had been sent to him for an examination of the heart. In two cases the hernia occurred through an abnormally large opening for the œsophagus, and two had an opening through the dome of the diaphragm. Dr. Kessler points out that we cannot be absolutely certain of the existence of non-traumatic hernia, as an injury may have been received without the patient's knowledge. The symptoms are not very distinctive and the history may be misleading. The condition, however, is easily recognised by the use of the X rays. As a rule, there is pain in the lower part of the left side of the chest which will have a resonant note if the stomach is full of gas, and there will be an absence of heart sounds in this area. Vomiting is not always present. There may be distension and dyspnœa, and, at times, regurgitation. Unless strangulation occurs the condition is not fatal. Dr. Kessler has collected 15 cases from recent literature of diaphragmatic hernia, six of which were congenital, eight traumatic, and one, like his own, without any history of injury.

THE TEACHING OF SURGERY BY KINEMATOGRAPHIC FILMS.

Doyen was the pioneer of the kinematographic teaching of surgical technique, and as far back as 1898 some of his operations were filmed for lecture purposes. Little was heard of surgical films in this country until a demonstration given three years ago by the Selig and Phillips Film Companies of the work of American surgeons, in which H. Lilienthal was seen performing a gastrostomy and F. H. Albee fixing an inlay bone-graft. An apparatus for taking the films has recently been perfected by Dr. Alex. v. Rothe, director of the Wilmersdorf Hospital in Berlin. The lens of this apparatus is contained in a spherical aseptic case suspended from the ceiling and focused by means of a periscope; it does not interfere in any way with the surgeon's freedom of action. The success has been such that the German Government has sanctioned the installation in six leading Berlin clinics. Some films obtained with the v. Rothe apparatus were shown by Dr. Bertram Stone last week at a private meeting of medical men in Portsmouth. They were noticeable for showing every detail of the operations from a vantage point which is denied to the ordinary onlooker, and, indeed, to the surgeon's assistant himself. The possibilities for teaching purposes opened up by this method are very great. Text-book descriptions convey little instruction when compared with kinematograph films, and the practising surgeon who nowadays is in the habit of travelling abroad at considerable expense to obtain inadequate glimpses of the technique of other operators than himself should in the future be able to study any particular operation as performed by the most eminent specialists in Europe and America without the necessity of going away from home. The surgeons whose work was displayed at Portsmouth were Krause, Bier, and Donitz, and the surgical procedures, which were shown in every detail from beginning to end, included a craniotomy for Jacksonian epilepsy with electrical localisation of the affected area of cortex, wiring a fractured patella, and gastro-enterostomy for a chronic gastric ulcer. The next desideratum is to obtain coloured films.

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[1] American Journal of the Medical Sciences, June, 1923.

[1] Journal of Radiology, June, 1923.

THE EXPERIMENTAL REPRODUCTION OF MALARIA.

THE problem of relapses in malaria is one of the most interesting from a practical point of view in addition to being one of the most complex. In the daily combat that individuals, associations, and nations engage in against the periodic epidemic, the resistant link in the chain that binds one yearly epidemic to another is represented by the malarial relapse ; in treatment and prophylaxis the national measures which are tried are shattered against its exasperating insistence. The cure of the disease, therefore, and the prevention of the annual epidemics will proceed on rational lines as soon as the problem of the pathogenic mechanism of the relapse is solved. That the relapse is caused by the reproduction of the gametes in the circulation is no new idea, but the morphological demonstration of the fact has never met with universal acceptation and the problem in regard to the semilunar bodies is more than ever obscure owing to futile attempts to seek such evidence. There is an alternate method—viz., to attempt the reproduction of malaria by means of inoculating gametes only, and Prof. T. Pontano, of the University of Rome, has lately conducted some very interesting experiments on this point.[1] The experiments came under three categories, the first consisting of six inocuations of malarial blood quininised for a long period and containing crescent forms only, the second consisting of three experiments with malignant tertian blood which after quininisation was free from parasites, and the third of two experiments with malarial blood containing annular parasites and not quininised. Of these 11 experiments, the first six in which blood containing only crescent bodies was inoculated gave our positive results and two negative ; the period of quininisation varied, being never less than seven days, rom 16 to 74 days in the others, and had the object of destroying the asexual forms of the parasite. The amount of blood inoculated was from 8–10 c.cm., the ncubation period varied from 7 11 days, and the idenity of the malarial attack was proved by discovery of the parasite in the blood, fever, and enlargement of he spleen. The second series of experiments conisting of three inoculations of malarial blood which howed at first numerous asexual forms of plasmodium præcox and which after prolonged and intense quininisation became free from parasites, all gave negative results after clinical and hæmatological observation lasting from a month to a year. The onors were treated with daily doses of 2 g. of quinine and were sterilised much more easily. The last two xperiments of injecting blood containing only annular orms of plasmodium præcox and not quininised both ave positive results. These experiments seem to show hat the crescent body is responsible for the transmission of malaria and no longer represents in the irculation a sterile body but a gametic parasite, apable of generating schizonts, and further, that the sexual parasites or schizonts disappear from the irculation during and after intense quininisation. In hese researches in which plasmodium præcox was noculated the same parasite was always found in the relapses and transformation of one kind of malarial parasite into another was never seen. The chief point of interest in these observations is that intravenous inoculation of crescent-containing blood after prolonged quininisation and free from asexual parasites caused malarial infection in unaffected subjects, while, on the other hand, blood containing only schizonts but quininised until the disappearance of the parasites did not cause any infection ; the crescents or gametes of plasmodium præcox were capable of proliferation and of generating asexual fever-producing parasites. Moreover, it was found that relapses occurred obstinately after inoculation with crescent-containing blood, while the experimental malaria caused by schizonts was easily curable. The schizonts which accompany the crescents in the circulation disappeared with difficulty after quininisation, while malarial blood was easily sterilised when schizonts alone were found in the peripheral circulation. These two facts find their explanation in the reproductive capacity of the gametes and in their resistances to the specific remedy.

SAILORS AND VENEREAL DISEASE.

THE Merchant's Shipping Act (Amendments) Bill, which received the Royal Assent and became law on August 2nd, removes a disability in the treatment of masters and sailors of the mercantile marine. Subsection 1 of Section 34 of the Merchant's Shipping Act of 1906, whilst it provided for the gratuitous treatment of injuries and illnesses aboard ship and in hospital, categorically excluded venereal disease, with the result that sailors were not only denied treatment but were liable to be left friendless and without funds whilst in foreign hospitals. Foreign doctors and irregular practitioners charged excessive sums for treatment that was in many cases incomplete if not worse. The Royal Commission which sat between 1913 and 1915 advised gratuitous treatment in the British Isles for venereal disease, and last year 162,000 persons availed themselves of this privilege from which British sailors in British ships were excluded. The new Act is no more than a simple act of justice to the British seaman. Although the Bill consisted of a single clause it has entailed a good deal of hard work from Sir John Collie who was in charge of it, and who was fortunate in obtaining the hearty support of the Minister of Health and of Lord Wolmer, Parliamentary Secretary to the Board of Trade, as well as of the Shipping Federation and the Seafarer's Joint Council. From the public health point of view this small Bill is of considerable importance, for the perfunctory treatment which these cases received, and the concealment which the law encouraged, must have had a material effect in spreading disease when the sailors returned to this country. We congratulate the party whose efforts placed it on the Statute book.

THE USE OF THYMUS EXTRACT AS A THERAPEUTIC AGENT.

VERY little is known of the physiology and pathology of the thymus gland nor of the indications for its administration as a therapeutic agent. Felix Boenheim,[1] of Berlin, gives some results of treatment carried out by him with extracts of this organ in various pathological conditions. There is at present no clinical evidence of deficiency of the gland, and therefore it cannot be used as a substitute, as in the case of the thyroid, but experimentally it can be shown that the thymus counteracts some of the other endocrine glands, and so can be used when they are showing signs of excessive secretion. Combined with iodine, Dr. Boenheim finds that thymus has a very beneficial effect on colloid goitre and on exophthalmic goitre, the thymus preventing all traces of iodism. It has, however, no effect on the cysts in cases of cystic goitre, for while the general enlargement diminishes the cysts become more prominent. The treatment has been effective where

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[1] Il Policlinico, Medical Section, xxx., June 1st, 1923

[1] Deutsche medizinische Wochenschrift, April 13th, 1923.

X rays have proved valueless. In certain cases of hyperacidity of the gastric secretion associated with hyperthyroidism, administration of thymus restores the secretion to its normal content. Dr. Boenheim explains this phenomenon on the basis that one of the functions of the thymus is to diminish the rate of mobilisation of the chlorides, whereas the thyroid increases it. Increased function of the thyroid leads to increased mobilisation of chlorides. This causes hyperchlorhydria, which in its turn leads to hyperacidity and increased secretion of the gastric glands. The thymus counteracts this chain of events. In other forms of hyperacidity, such as that due to gastric ulcer, and the neural form (tabes), the thymus has no effect. In phthisis, thymus has proved a powerful aid, leading to an increase in the appetite and of the weight. This effect is probably due to its action on the gastric secretion in diminishing the hyperacidity which is often found in tuberculosis. Caution must be used during pregnancy, for here the thymus may have ill effects, and is not capable of antagonising the thyroid. The asthenias show great improvement with thymus administration. Dr. Boenheim recommends the preparation of Burroughs, Wellcome and Co., 1–2 tablets thrice daily, in preference to any of the German preparations.

THE CORPUS LUTEUM AFTER HYSTERECTOMY.

It is usually assumed that extirpation of the uterus is without any very noticeable effect on the ovaries. Experiments in the guinea-pig by Leo Loeb, of Washington University,[1] show that a complete or almost complete extirpation of the uterus may be followed by a very characteristic effect—namely, a long-continued preservation and activity of the corpus luteum. Instead of beginning to degenerate 14 or 15 days after ovulation, the corpus luteum may remain well preserved and even show mitotic proliferation for 60 days or longer after the last heat. The cyclic corpus luteum thus equals or surpasses in vitality the corpus luteum of pregnancy, which latter has in the guinea-pig a duration of about 65 days. This effect—long preservation of the corpus luteum—occurs if the uterus is extirpated a few days after ovulation. If the uterus is extirpated in very young guinea-pigs when an ovulation has not yet occurred, the first ovulation takes place, notwithstanding the extirpation of the uterus, from 9 to 29 days after the operation. The corpus luteum which thus originates remains preserved for a long period of time with mitotic figures in the lutein cells. Extirpation of the uterus does not directly prevent ovulation, but it has such an effect indirectly by preserving the life of the corpora lutea. In other respects the ovaries in hysterectomised guinea-pigs are normal. Follicles grow in the normal manner, mature, and undergo atresia. These corpora lutea not only live, but they also function and prevent the occurrence of an ovulation during the whole period of their life; but if the corpora lutea are extirpated completely, a new ovulation takes place at an early period notwithstanding the absence of the uterus, an additional proof that the hysterectomy as such does not prevent ovulation. If, however, the maturation of follicles is prevented through underfeeding, a new corpus luteum does not develop in a young guinea-pig which has not yet ovulated, even after extirpation of the uterus. This marked prolongation in the life and function of the corpus luteum may not only be obtained after a complete hysterectomy, but even in cases where a very small amount of uterine tissue has been left unremoved. In hysterectomised animals the mammary gland develops quite markedly, and mitotic proliferation may be observed in such glands as late as 74 days after the last ovulation. If one-third or one-fourth of the length of the uterus is left unremoved the full effects of this operation are not observed, although the life and function of the corpus luteum is somewhat prolonged even under these conditions. It would seem, therefore, that a relatively small part of the uterus can at least to a great extent take over the function of the whole.

THE RÔLE OF PULEX IRRITANS IN THE SPREAD OF BUBONIC PLAGUE IN GREAT BRITAIN.

In an instructive summary of our present knowledge upon the epidemiology of plague, Dr. William Lethem,[1] assistant medical officer of health for the City and Port of Liverpool, remarks that the disease, as it occurs in Britain now, differs notably from the pest of the Middle Ages. This decrease cannot be attributed solely to public health legislation, but in part at least to the almost complete disappearance of the old English black rat (*R. rattus*), which has been swept away by the brown or Norwegian rat (*R. decumanus*) since its introduction in 1727—one of the most remarkable instances in zoology of the replacement of one closely allied species by another. *Ceratophyllus fasciatus*, the plague flea of colder climates, is by no means such a successful carrier of plague as *Xenopsylla cheopis*, the plague flea of the tropics, nor does it bite man so readily; it lives by preference not on the rat itself, but in the nest, often situated underground. Under experimental conditions, this flea is known to carry infection for 47 days, considerably longer than *X. cheopis*, but owing to its habits man rarely comes into contact with *C. fasciatus*. In the tropics the black rat is a domestic species which lives in close contact with man, and harbours in its coat *X. cheopis*, a ready carrier of plague; the parasite, moreover, forsakes the rat immediately after its death. These differences may account for the scarcity of plague in Britain, but they do not explain why, when a case has occurred, the disease tends to be confined to a single household and to those in most intimate contact with the patient. Dr. Lethem thinks that the human flea (*Pulex irritans*) has hitherto been ruled out as a source of danger on very little evidence. It dies off at 85° F., and is less common in India than in Great Britain. When the outbreaks of plague since 1900 are considered, we find that, unlike tropical epidemics, either no plague rats are found or they are present in insufficient numbers to bear any relation to the human cases. It is suggested that in these instances *Pulex irritans* acts as a direct vector of the infection from one man to another. The most convincing instance of this is the Suffolk outbreak in 1910, in which seven bubonic cases occurred in one house in rapid succession. The human flea can only retain the infection for a few days, whilst the rat fleas can do so for 6 to 13 weeks. On the evidence it seems probable that epidemics of bubonic plague in Great Britain are not caused by the rat flea but that infection is spread by the human flea—*Pulex irritans*.

MINERS' NYSTAGMUS: THE QUESTION OF COMPENSATION.

The second report of the Miners' Nystagmus Committee of the Medical Research Council, just published, discloses what appears to be a serious flaw in the Workmen's Compensation Act. The report is mainly the work of Mr. G. H. Pooley, but is endorsed by the other members of the committee—namely, Dr. J. S. Haldane, Prof. E L. Collis, and Dr. T. L Llewellyn. After contrasting the relative prevalence of *compensated* incapacity from this cause, on the one hand in France, Belgium and Germany, where it is small, with that in England, where it is great and increasing, it goes on to point out the explanation of this difference. This lies not in an increase in the number of those actually affected, but entirely, the report implies, in a very decided increase in the number of those seeking and obtaining compensation in this country, and this from three causes. In the first place the new schedule in 1913 altered the nomenclature of the disease from "nystagmus" to "the disease known as miners' nystagmus . . . . whether the symptom of oscillation of the eye-balls be present or not." The result was to include cases claiming compensation for psychoneurosis. Secondly, the maximum compensation money was raised in 1919 from 20*s.* to 35*s.* a week, and while wages and the cost of living have been reduced since then the compensation has remained the same. Consequently, it is found to be not rare for miners disabled from some general disease not arising from their work to be obtaining compensation for nystagmus which, if they had been otherwise in good health, they would not have claimed. In the third place, whereas abroad only severe cases of nystagmus are admitted for compensation, in this country slight cases are admitted under the belief that any degree of oscillation of the eye-balls renders the miner unsuitable for underground work and that it tends to get worse if underground work is continued. Owing to the combined action of these three causes, not only the number of fresh claims but the average duration of incapacity has risen enormously, facts which, the report implies, have no relation whatever to the actual prevalence of the disease, but solely to the facilities for obtaining compensation. In the opinion of the Committee the compensation is in many cases entirely unnecessary, as, in their opinion, mild cases of nystagmus do not necessarily involve incapacity for work, and in fact often persist for years without the knowledge of the patient. The most important conclusion is that "most cases of miners' nystagmus are only partially incapacitated; they benefit physically and psychologically by work. Some require work above ground; others are fit for suitable work below ground. All men in this group should receive every encouragement to start work as soon as possible."

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[1] Proc. Soc. for Expt. Biol. and Medicine, vol. xx., No. 8, 1923.

[1] The Medical Officer, July 21st, 1923.

It will be seen that this report throws down a challenge. If its conclusions are justified a drastic alteration in the law of compensation is called for, but the legislator may fairly demand some sort of unanimity of opinion among the experts. The important points at issue are first, whether the psychoneurotic symptoms are an essential part of the disease, and secondly, whether or not slight cases of nystagmus tend to become worse with a continuance of underground work. We do not propose to pass judgment as between the two opposing schools of thought, but merely to call attention to a matter which is not only of medical but of economic and sociological importance. It is alleged that thousands of pounds are being spent every week in a manner worse than wasteful. Can this challenge be answered?

SMALL-POX IN ENGLAND AND WALES.

THE epidemic of small-pox is definitely on the wane; 51 new cases were reported in England and Wales during the week ended July 28th, as compared with 116 new cases (with 1 death) in the preceding week, and 148 new cases (with 1 death) in the week before hat. These 51 cases occurred in the following areas: Derbyshire 6 (Long Eaton); Gloucestershire 22 (all n Gloucester, and including 1 case previously notified as chicken-pox); Notts, 16 (Kirkby-in-Ashfield 9, Warsop 6, Basford R.D. 1); Yorks, North Riding, (Middlesbrough); Yorks, West Riding, 4 (Bentley-with-Arksey 3, Doncaster 1); Monmouthshire 2 Newport 1, Rhymney 1). There is diminishing ncidence in all the areas affected and no new areas are nvolved. The outbreak is now following the course which is to be expected when the disease is frankly ecognised and dealt with on the lines of established hygienic experience. The County of Devon, for nstance, is bestirring itself, after years of fruitless discussion, to provide isolation accommodation hroughout the administrative area, in which only two ocal authorities, Torquay and Plympton, have as yet made adequate provision. Vaccinations in Gloucester are stated to have averaged 2000 a month since April last.

Modern Technique in Treatment.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

XXXII.

TREATMENT OF EXOPHTHALMIC GOITRE AND OTHER FORMS OF HYPERTHYROIDISM.

IN undertaking the treatment of exophthalmic goitre and the allied conditions of simple hyperthyroidism and toxic adenoma, it is important to have a clear conception of the aims of the treatment and of the principles which underlie its practical application. In this group of maladies we have to deal with one common factor, the abnormal activity of the thyroid gland, in consequence of which an excess of secretion is poured into the blood and conveyed to the tissues of the body in which the thyroidal hormones raise the metabolic rate above the normal level. The problem we have to consider is how to restore the functional activity of the thyroid gland to a normal level as soon and as safely as possible. Whatever the true causation and pathology of exophthalmic goitre may be, experience shows that, provided no irreparable damage has been sustained by the heart, kidneys, or pancreas, when the function of the thyroid gland is restored to a normal level recovery takes place.

In estimating the results of treatment, the pulse-rate should be taken daily under the same circumstances when the patient is at rest, and the weight recorded each month. A steady diminution of the pulse-rate and increase in the weight are favourable indications. The tremor, nervousness, and mental excitability are additional guides as to progress. Regular monthly estimations of the basal metabolic rate, when circumstances allow of accurate observations being made, are of great value in assessing the value of treatment.

General Management.—The circumstances of each individual case should be fully investigated, so that all conditions which are likely to stimulate the thyroid gland may, as far as possible, be either removed or guarded against. Some of the most injurious factors which can often be controlled are those arising from nervous strain and anxiety, physical exertion, septic absorption, sexual excess, erroneous diet, and residence near the sea or in a hot climate. Other factors, such as accident, fright, shock, and worry, are beyond our power to prevent, though their ill-effects may be diminished by the exercise of additional care immediately after their occurrence. Thus, nervous strain arising from some special occupation may be relieved by change of work in mild cases, or by complete rest in severe ones. Change of surroundings, as from the town to a quiet country place, is often of service. The seaside should be avoided, as the symptoms are apt to be aggravated by a visit to the sea. Any occupation which involves such efforts as accelerate the already frequent pulse must be given up. In severe cases complete rest in bed for several weeks or even months is advisable. In mild cases, rest in bed for 12 hours at night and for two hours in the afternoon may be sufficient. Rest in the open air in a quiet garden is suitable for those who can stay in the country, and in warm weather as little exercise as possible should be taken. Any septic focus in the mouth, naso-pharynx, or elsewhere must be dealt with at the commencement of treatment.

Diet.—Red meats and their extracts should be avoided. Fish, eggs, chicken, and fat bacon can be allowed. Bread, vegetables, and fruit are suitable, and butter may be taken sparingly. If there is emaciation, milk may be given up to as much as three or four pints in the day. Half an ounce of cod-liver oil should be given daily in one or two doses. Alcohol and coffee should not be taken.

Medicinal Treatment.—A few drugs are useful in the treatment of the malady, and others are helpful in the relief of special symptoms and complications. Quinine hydrobromide, gr. iii.-v., thrice daily is of much value, though some patients are intolerant of it. Liquor arsenicalis, ♏. iii.-v., may be given twice or thrice daily for three weeks each month for several months. If nervousness or tremor are marked symptoms, it is advisable to add sodium bromide, gr. v., to the mixture. The various organic preparations which have been employed, such as rodagen, half a drachm, or thyroidectin, gr. v., thrice daily, and the like, have yielded no consistently good results. The whole of the milk of a thyroidless goat has an excellent effect in some cases when an adequate supply has been obtainable. Suprarenal tablets have proved helpful in some cases. No preparation which contains any thyroid extract or iodine should be given.

Radiological and Electrical Treatment.—A prolonged course of treatment by X rays or radium in skilled hands is one of the most reliable means we possess of controlling the activity of the thyroid gland, and in many cases, of hastening its return to a normal condition. When X ray treatment is available, a dose of one and a half Sabouraud units, measured before filtration and passed through a layer of 3 mm. of aluminium and boiler felt placed on the skin, may be given twice a week. Later on this dose may be given at lengthening intervals, according to the progress made. Larger doses may be given at longer intervals, the object being to give as large a dose as possible without injury to the skin. This treatment finds its most favourable opportunity in cases of simple hyperthyroidism and in the milder cases of Graves's disease. It is also of value in severe cases. In cases of Graves's disease in which the goitre is unusually large, and in cases of toxic adenoma, the results are unsatisfactory, and if a subsequent operation becomes necessary, the capsular adhesions render it more difficult. For patients who live at a distance radium is more convenient, as the plates have only to be applied for 24 hours once every six weeks. A radiotherapeutic course requires six months, a year, or even two years to produce its full effect. Radium is unsuitable for acute cases of exophthalmic goitre, as the initial increase of secretion may prove fatal. When radiotherapeutical treatment is not available a mild interrupted current may be applied by means of electrodes placed over the goitre and at the back of the neck for an hour twice a day.

Complications.—Serious complications may develop in cases of Graves's disease. Thus dangerous crises may be set up by periods of acute hyperthyroidism during which the rapid increase of thyroxin and possibly of other hormones in the blood may cause a marked exacerbation of all the symptoms. In other cases only certain organs react violently to the stimulation. Thus there may be gastro-intestinal crises with intractable vomiting or diarrhœa. Cardiovascular crises may occur with excessive palpitation, greatly increased pulse-rate, and marked restlessness. In all these absolute rest and quiet are essential. Cold may be applied alternately over the goitre and to the præcordium, if the pulse-rate is high, by means of a Leiter's tube or an ice-bag. In gastro-intestinal crises enemata of 5 to 10 oz. of warm water containing a drachm each of sodium bicarbonate and glucose may be given every four hours or run slowly and continuously into the rectum by syphonage from a thermos flask. Half an ounce of pancreatised milk may be given by the mouth every half hour. The vomiting may be controlled by small doses of morphia, given hypodermically or in a suppository, or by the injection of 0·5 c.cm. of pituitrin every 6 or 12 hours. Failing these, 5 gr. of chloral hydrate in a cachet may be given several times in the day. When diarrhœa is a prominent symptom, laudanum may be given with dilute sulphuric acid as required. In the later stages of severe cases of exophthalmic goitre chronic myocarditis with dilatation and hypertrophy of the heart may be present. Under these circumstances there may be auricular fibrillation and gradual cardiac failure. The treatment of this complication is the same as in cardiac failure from other causes, and digitalis or quinidine sulphate may appropriately be employed.

Surgical Treatment.—Although discussion of the surgical treatment does not come within the scope of this article, a brief statement as to the chief indications for operation may be given. In cases of simple hyperthyroidism and in mild cases of Graves's disease no operation is required. In cases of toxic adenoma of the thyroid gland, and in all cases in which signs of pressure on the trachea or recurrent laryngeal nerves are present, operation is required, as cases of toxic adenoma do not as a rule do well under medical treatment, and pressure signs require immediate relief. The selection of suitable cases of Graves's disease for operation is difficult. Cases in which no improvement has taken place after six months' trial of medical treatment, and those in which the goitre is unusually large, are the most suitable for operative treatment by ligation of the thyroid vessels or by partial removal of the goitre. In other cases the physical condition, social position, and wishes of the patient must all be fully considered in the selection of each individual case for operation, for with every care the mortality after operation, though gradually diminishing, is still from 3 to 5 per cent.

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Special Articles.

BRITISH DENTAL ASSOCIATION:

ANNUAL MEETING AT MANCHESTER.

ABOUT 400 dentists are attending the forty-third annual meeting which opened at Manchester in the College of Technology on July 31st, the President being Mr. George G. Campion, of Manchester. It is 31 years since the Association met in this city and the President for the current year is the son of Mr. H. Campion, of Manchester, who was President when the Association last visited the city. The Senior Pro-Vice-Chancellor of the University—Mr. Edward Fiddes—described the growth of the dental school established at the University 39 years ago, and now attended by over 140 students, university training having superseded the former practice of apprenticeship.

President's Address.

The President, in his inaugural address, emphasised the change that had come over dentistry in the last two decades, and congratulated the Association on the fact that their views as to the relation of the State and the dentist had at last received recognition by the Government, and that the Government had at last laid down a skeleton organisation for dealing with this urgent problem of national health and efficiency. It was now known, on the authority of a Government Committee's report, that one-third of all disease in the country was due directly or indirectly to dental disease. Among the general population it was found that the condition of the teeth of women was worse than that of men. In the Western Command from April, 1917, to March, 1918, it was found that between 80 and 90 per cent. of recruits were in need of dental treatment. To avoid the trouble which follows dental disease it was essential to provide from earliest childhood for adequate inspection and treatment, including the practice of cleanliness, the use of a detergent diet, and early conservative dentistry. The State and local authorities had created a nucleus of an organisation for the application of dental knowledge by arranging a dental service in 232 of the 1870 maternity and child welfare clinics now functioning in England and Wales. Other forms of dental service were those of school clinics, tuberculosis clinics, additional benefit under the Health Insurance Act, industrial dental clinics, and the Royal Naval Dental Service and Army Dental Corps. At present—even with the clinics privately organised by a large number of industrial firms—the national service was quite inadequate. School clinics were at present staffed by about 450 dental officers—compared with the school population for England and Wales of about 7 million. For efficient dental work it was calculated that there should be one dental officer for each 5000 children. At present there was not the equivalent of one officer for each 15,000 children. As showing what can be done by the cumulative benefit of treatment over a number of years at a school dental clinic, Cambridge affords a classical example. In 1908, at this clinic only 15 per cent. of the children had sound permanent teeth; the figures in 1920 had been reversed, and the percentage had become 51. Views stated by members of the dental profession ten or more years ago were now proclaimed by the Ministry of Health. Above all the enlightenment of the public on the need for early conservative dentistry must not be relaxed by the Association. The next meeting of the Association will be held in Edinburgh next year, and Mr. J. S. Amoore (Edinburgh) was elected as the succeeding president.

Effects of Diet on the Structure of the Teeth.

At the meeting on August 1st Mrs. May Mellanby spoke on the effects of diet on the structure of the teeth, expounding the researches she had made on behalf of the Medical Research Council on the question of growth of the teeth in dogs. It was proved that the amount of calcium in the diet was not the dominant factor in the calcification of teeth; in this connexion particular importance had to be attached to the content of vitamin A in the diet, which, taken in large amounts, retained and incorporated in the tissues of the body, more especially in the teeth, the calcium salts in the diet. If this vitamin was deficient in the diet, the more cereal was eaten the worse formed were the teeth. Both dentine and enamel were very defective on a diet of oatmeal, but when cod-liver oil rich in vitamin A was added to the oatmeal diet, the dentine and enamel were practically normal. Mrs. Mellanby wished to make it clear that the calcium and phosphorus of the diet do not in themselves control teeth calcification but that their action is subservient to other elements of the diet. The effects of oatmeal on the formation of the teeth raised the question of the excellent teeth of the Highlander at a time when oatmeal formed a large part of his diet. No doubt the calcifying vitamin of herring would play an important part. Milk would also antagonise the action of oatmeal. Thus a diet of milk, eggs, green vegetables, herring, and oatmeal would be expected on the basis of the xperimental results to produce perfectly normal eeth. On the other hand, dietary made up of ereals, and especially oatmeal, together with such ood as vegetable margarine, lard, lean meat, jam, ugar, tea, all substances of widespread consumption n modern dietaries, would be expected to lead to the evelopment of defective teeth and jaws.

Æsthetic Considerations.

Mr. Edward C. Kirk, in a communication on Artistic Harmony in Dentures, expressed regret hat despite the best endeavours of dentists to peruade their clients to accept artificial teeth which were in harmony with the wearer's other features nd expressive of individual character, the public ppeared still to demand the ghastly exhibits of nquestionably false teeth of geometrical evenness nd glittering whiteness, worn indiscriminately by ertain sections of the community, young and old, of oth sexes. The speaker suggested a connexion etween this untoward phenomenon and the superstition, prevalent in some parts of central Europe, that as the milk teeth were shed the child dropped hem into a mouse-hole, the succeeding teeth would e small, white, and even like the teeth of a mouse.

BRITISH MEDICAL ASSOCIATION.

ANNUAL MEETING AT PORTSMOUTH.

(Continued from p. 233.)

SECTION OF SURGERY.

WEDNESDAY, JULY 25TH.

ON the first day of this section Sir HENRY GRAY, the President, being in the chair, a discussion on the

Treatment of Obstruction of the Colon

was opened by Prof. A. H. BURGESS (Manchester), who based his remarks on the statistics of the Manchester Royal Infirmary during the ten year period 1913–22. During this time out of a total admission of 66,373 cases to the wards, 1278 were for obstruction of the small or large intestine—the term "obstruction" being taken for the purpose of the discussion to include only those cases in which some gross mechanical obstacle was present. Excluding cases of intussusception, the colon was concerned in 199 of the 1278 cases, or 17·87 per cent., the pathological causes of the acute obstruction being distributed as in Table I.

TABLE I.

—	No. of cases.	Deaths.	Percentage mortality.
Malignant growths of colon ..	173	59	34·1
Extracolonic malignant growths	2	0	
Strangulated hernia	9	3	33·3
Adhesions	7	0	
Tuberculous disease of cæcum ..	2	0	
Acute diverticulitis	1	0	
Volvulus	5	2	40·0
Total	199	64	32·2

The table showed the great preponderance of malignant growth as compared with other causes of acute colonic obstruction, constituting nearly 90 per cent. of all cases. During the period under review 485 cases of malignant growth of the large intestine were admitted, 173 of which were associated with acute obstruction, giving a percentage of 35·67. A table was given showing the proportional distribution of these growths with the relative incidence of acute obstruction at each site and the mortality. The figures showed that the rectum was concerned in 46·59 of all growths, but only for 10·98 of those associated with acute obstruction. The sigmoid colon showed a percentage frequency of 29·48 but occurred in 51·44 per cent. of all cases of acute colonic obstruction from malignant growth. The cæcum showed a percentage frequency of 5·15, and a percentage association of obstruction of 6·35. It was also shown that only 13·29 per cent. of the growths causing obstruction were on the right side, as against 86·7 per cent. on the left—a fact not without importance in relation to operative treatment.

The various operations performed for malignant and non-malignant obstruction were included in Table II.

He laid it down as a basic principle of the treatment of acute obstruction of the colon that—contrary to the principle obtaining in the case of the small intestine where it is the operation of choice—resection with immediate restoration of continuity (that is, without drainage of the proximal bowel) is an unjustifiable procedure. In the series under review it was performed 9 times with 3 recoveries (2 of cæcum, 1 of sigmoid) and 6 deaths (1 of transverse colon, 1 of splenic flexure, and 4 of sigmoid)—a mortality of 66·6 per cent., which was almost double the average mortality of the whole series. In the ileo-cæcal region the conditions approximated to those obtaining in the small bowel, and this was the only region of the colon in which primary resection followed by immediate anastomosis might be done. Whenever resection of the colon was essential, as in gangrene from volvulus and internal strangulation, it should be combined with drainage of each end of the bowel, preferably by tying in a Paul's tube; at a later operation continuity might be restored. This two-stage operation was sometimes advocated in acute colonic obstruction from malignant growth, but should, in the speaker's opinion, be restricted to cases in which the colon was grangrenous. In malignant growth it was better to do a cæcostomy for the immediate relief of the obstruction and to follow this up later by a thorough excision of the affected portion of the bowel and its corresponding lymphatic area.

Table II.

—	No. of cases.	Deaths.	Percentage mortality.
A. *Malignant Obstructions*—175 cases (173 growths of colon, 2 extracolonic growths).			
1. Exploratory laparotomy, followed by—			
(*a*) Primary resection ..	9	6	66·6
(*b*) Lateral anastomosis ..	11	3	27·7
(*c*) Cæcostomy	56	18	32·1
(*d*) Colostomy, transverse ..	13	5	38·5
(*e*) Colostomy, sigmoid ..	63	21	33·3
2. Colostomy alone (all sigmoid)	17	5	29·4
3. Cæcostomy alone	5	3	60·0
4. Enterostomy alone.. ..	1	1	100·0
Total	175	62	35·2
B. *Non-Malignant Obstructions.*			
1. Herniotomy..	9	3	33·33
2. Division of adhesions ..	7	0	
3. Ileo-sigmoidostomy for tuberculous cæcum	2	0	
4. Laparotomy and drainage for acute diverticulitis	1	0	
5. Volvulus—			
(*a*) Untwisting alone ..	1	1	100·0
(*b*) Untwisting combined with colostomy	4	1	25·0
Total	24	5	20·8
Total of all cases ..	199	67	33·7

Lateral anastomosis was performed in 11 cases with 3 deaths. In all these cases a preliminary laparotomy had disclosed an inoperable malignant growth and the palliative anastomosis was the alternative to colostomy. In obstruction from growth of the colon a cæco-colostomy should be performed rather than an ileo-colostomy in cases where the ileo-cæcal valve is competent to prevent the regurgitation of cæcal contents into the ileum, an ileo-colostomy entailing in such circumstances, unless combined with either appendicostomy or cæcostomy to prevent tension, a serious risk of gangrene or perforation of the cæcum.

Prof. Burgess then discussed the treatment of acute obstruction of the colon: (1) When it was uncertain whether the obstruction was in the ileum or in the colon; (2) when the obstruction was known to be in the colon but its exact situation was unknown; and (3) when the site of the obstruction in the colon was definitely known.

1. A careful inquiry into the history was useful, the absence of any intestinal troubles prior to the onset of obstruction being in favour of the implication of the small intestine, while pain, diarrhœa, constipation, mucus, with or without blood, in the stools suggested colonic obstruction. The use of the sigmoidoscope and of radiography was scarcely practicable in acute cases, and reliance had to be placed chiefly upon a physical examination of the distended abdomen; its shape, the position of the bulging, the presence of "ladder patterns," as in ileal obstruction, the detection of visible or of palpable peristalsis. Auscultation was also useful to an experienced observer. The "keynote" to the diagnosis was the condition of the cæcum; if this was visibly distended or was felt alternately to harden and soften under the fingers the obstruction was distal to it. When all methods of physical investigation failed, including rectal and vaginal examination, an exploratory laparotomy must be made, preferably through a paramedian incision, splitting the fibres of the lower portion of the right rectus abdominis. When the obstruction was located and its cause found to be an operable growth, the incision could usually be closed and a cæcostomy performed through a "gridiron" incision in the right iliac fossa. Where the growth was inoperable, short-circuiting was indicated where practicable, or failing this a colostomy just above the growth. In the most desperate cases of group (*a*) it was better to make no attempt to find the obstruction, but the cæcum should be exposed under local anæsthesia, and if found distended should immediately be opened ("blind" cæcostomy); if collapsed the first distended coil of ileum presenting should be opened and drained ("blind" enterostomy). In the latter case, should the patient survive further surgical intervention would certainly be called for later on.

2. In cases belonging to this group there was, as the statistics showed, an overwhelming chance that the obstruction was a malignant growth and situated on the left side. In severe cases a "blind" cæcostomy under local anæsthesia was indicated In mild cases, in the absence of any localised tenderness over the cæcum, conservative measures such as repeated enemata, &c., might remove the obstruction, allowing a radical exploration to be made at a later date In the moderately severe cases the choice of preliminary procedure lay between a paramedian exploration and a "blind" cæcostomy. The advantages of the latter were: (1) It could be performed rapidly under local anæsthesia, and with the minimum of shock. (2) There was no interference with the growth and no new adhesions were formed. (3) The cæcostomy opening was as far removed from the area of any further operation as an artificial anus could be. (4) It formed a good safety valve during any subsequent resection operation, giving rest to the sutured bowel and minimising the risk of leakage at the point of suture. (5) When not further required it often closed spontaneously on leaving out the tube, or in any case could readily be sutured. On the other hand, an adequate exploratory operation was always difficult in a distended abdomen, required a general or spinal anæsthetic, and gave information (as to the site and nature of the obstruction) which, however valuable, was not essential at that stage of the proceedings. The speaker was firmly convinced that when in any given case of acute intestinal obstruction the site of obstruction could be located to the colon but was not more precisely known, and where there was no special reason to suspect volvulus or internal strangulation, "blind" cæcostomy should be performed as the sole immediate procedure.

3. In this group in which the actual situation of the colonic obstruction was known, where rectal examination showed the growth to be inoperable on account of local fixation to bladder, prostate, uterus, or sacrum, the operation of choice was a sigmoidostomy, since with a growth so low a future palliative short-circuit was impracticable. Where the growth was determined by rectal palpation to be operable, he preferred a laparotomy through a left paramedian incision, concluding the operation by fixing a loop of the sigmoid into the wound and opening either at once or a few hours later. In cases of palpable abdominal tumour or where obstruction had supervened shortly after a sigmoidoscopic or radioscopic investigation had disclosed its probable site, a cæcostomy was indicated for the immediate relief of obstruction, leaving the field clear for a later exploratory laparotomy, when resection, short-circuit, exclusion, sigmoidostomy, or transverse colostomy might be feasible, in this order of preference. Where none of these was practicable, the incision would be closed and the cæcostomy left as the permanent condition.

In conclusion, Prof. Burgess pointed out that although he had laid stress throughout his paper on what he believed to be the correct principles in the treatment of colonic obstruction once it had developed, yet it was to the earlier recognition of its most frequent cause—malignant growth—prior to the onset of that very serious complication that the attention of surgeons should in the future increasingly be directed.

Mr. **Seymour Barling** (Birmingham) said that there were three points he would wish to make. First with regard to diagnosis, he thought that no one would deny that it was of great advantage to the surgeon if the site of the obstruction were accurately known, and he emphasised the difficulty that this presented in so many cases. He therefore put before the meeting a new method of diagnosis, which he had recently used in three cases of acute intestinal obstruction. Provided that the patient was in a sufficiently fit condition to be able to stand upright for five seconds there was no contra-indication to the method. The patient was taken to the X ray room and screened in the upright position. In his case the intestine above the obstruction showed out very distinctly, and in one case in which the sigmoid was the seat of an annular carcinoma a horseshoe area of gas was seen with pools of fluid at each end, one in the cæcum and one just above the growth. He suggested that this procedure was of great value, and enabled one to relieve the obstruction with one's eyes open, and without any need for exploring the abdomen. Secondly, he wished to remind the section once again of the very poor operative risks most cases of acute intestinal obstruction were. He was sure that they had all had those distressing cases of collapse after quite small procedures. Therefore he urged that a cæcostomy done under a local anæsthesia was the operation of choice, and gave the lowest immediate mortality. Lastly, though an advocate of the cæcostomy, yet he realised some of its disadvantages, amongst them being the undoubted fact that it did not empty the distal part of the colon, and did not obtain that collapsed and empty colon that surgeons wished to see at the line of resection. He thought that the advocates of a blind cæcostomy must face the possibility of a second drainage operation prior to the main attack on the growth.

Mr. ARTHUR MITCHELL (Belfast) felt that he must take exception to Mr. Seymour Barling's remark that quite small procedures produce sudden and severe collapse. He thought that any exploration in cases of acute intestinal obstruction was very dangerous. It required extreme gentleness and absence of exposure, for the distended gut was very easily contused by the hand in the peritoneal cavity, and such contusions only added to the causes giving rise to toxic absorption. He was quite in accord that the easiest, safest, and more rapid method of relieving the obstruction was the correct thing to do, and he agreed that a blind cæcostomy fulfilled these conditions. At the same time he agreed that a cæcostomy did not always completely drain the obstructed colon, but it did abolish absorption of toxic contents. He was interested in Prof. Burgess's figures concerning lateral anastomosis, and was of opinion that this procedure might be more often used with advantage in inoperable cases. He considered that when a permanent colostomy was to be performed the most important consideration was the comfort of the patient, and in this connexion he strongly advised that the distal end should be completely divided, closed, and dropped back into the peritoneal cavity, and the proximal end sutured to the wound. He entered a plea for earlier diagnosis, and emphasised the great importance of diarrhœa as an early symptom. In conclusion, he quoted a case of a man aged 72 with acute obstruction of the sigmoid, in which the cause was a syphilitic infiltration and which was cured by antisyphilitic treatment.

Mr. HERBERT CARSON (London) said that he had had 79 cases of this kind in the large intestine, of these two were due to diverticulitis, five to ileo-cæcal tuberculosis, and 72 to carcinoma. Of these 45 per cent. had had acute intestinal obstruction, the site of which was mainly on the left side. Up to three years ago, only 35 per cent. were operable, but in the last three years the proportion had risen to 52 per cent. He wished to state emphatically that these cases should never be allowed to become obstructed, and that a great need existed for educating students and the general public in the premonitory symptoms. He recognised three clinical types of obstruction of the colon : 1. Partial obstruction, in which symptoms called early attention to the diagnosis, and in which a carefully planned radical attack on the growth was possible. 2. Chronic obstruction which had become acute, in which it was permissible to temporise, and treat with enemata and aperients, keeping a strict guard on the condition of the cæcum. These cases might thus be converted into group 1 cases. If necessary, the cæcum acting as the guide, a drainage operation might become necessary. 3. Acute obstruction the first sign. In these no single stage operation was ever possible, except with growths at the ileo-cæcal valve. He confessed that he was not yet convinced of the advantage of blind cæcostomy, and in his opinion there were the following disadvantages : cases of intussusception with the lump in the left side were unsuitable, a volvulus was not affected at all by a cæcostomy, cases of double obstruction in which the small intestine was involved secondarily to the large were not relieved, and lastly, in inoperable cases a cæcostomy might be a most unsuitable permanent condition, and yet some cases would not stand another operation. But he was a firm believer in a cæcostomy as a step in the technique of every resection. He also pleaded for the avoidance of long blind ends.

Mr. P. LOCKHART-MUMMERY (London) congratulated Prof. Burgess on his excellent paper. He pointed out that the mortality from operations for acute intestinal obstruction was 32 per cent., and that this, though comparing favourably with the figures from hospitals dealing with large industrial areas, was far too high, for we could not face a one in three death-rate with equanimity. He considered that this mortality could be greatly improved by performing blind cæcostomy and postponing the exploration till a later time. The other important factor was the use of local or regional anæsthesia, for he believed that inhalation anæsthesia should never be used in these cases. Mr. Lockhart-Mummery said that not only did he not do a blind cæcostomy on every case of acute colonic obstruction, but he made a practice of performing it as part of any operation which involved division of the colon. He had found that the mortality of colectomy had fallen considerably since the adoption of this procedure. The method of performing cæcostomy was the one he had described in THE LANCET, 1922, ii., 1117. He again stressed the importance of performing this operation under local anæsthesia.

Prof. C. A. PANNETT (London) said that he thought it was by no means easy to be certain that the obstruction in any given case was of the small or the large intestine, for these patients were usually toxic, often in great pain, and frequently unable to give a lucid history. He was personally against a blind cæcostomy unless he was sure of the large bowel being the seat of the obstruction. He quoted 47 cases of acute intestinal obstruction of the colon at St. Mary's Hospital; all had been explored at the time of the drainage operation. Of these one had died, and he felt that the dangers resulting from a further exploration were greatly over-estimated. Of these 47 cases only one-third were operable, and of the remaining two-thirds just over one-half could not be short-circuited. It seemed reasonable to him to ask the advocates of a blind cæcostomy why these people should have two colic fistulæ instead of one. When a blind cæcostomy had been done, he felt that every effort should be made to localise the growth prior to the main attack on it, and in this connexion he mentioned the fact that barium enemata were occasionally very misleading, and he showed four lantern slides illustrating X ray plates in which the barium had got past the stricture and filled the gut above.

Mr. GEARY GRANT (Cardiff) said that in his opinion a cæcostomy with a tightly distended œdematous and friable cæcum was not so easy as some would have us believe, and he was in favour of a colostomy.

Mr. C. P. CHILDE (Portsmouth) thought that in this question it was most desirable to exercise sound judgment and not to be bound by any hard-and-fast rules. He felt that it was self-evident that very severely toxic cases could only be dealt with satisfactorily by a blind cæcostomy, but he was convinced that early cases could be explored without any immediate ill-results following.

Mr. R. D. Mothersole (Bolton), speaking from the point of view of the general practitioner, said that he thought a colostomy had much to recommend it over a cæcostomy.

Mr. M. Mamourian (Ashton-under-Lyne) said that the procedure was governed by the patient's condition. When he found a cæcostomy necessary he used a Murphy's button.

Prof. Burgess, in concluding the discussion, said that he was convinced that blind cæcostomy was the right thing to do. He quite agreed that perhaps one or two cases of volvuli or gangrenous intestine in 100 might be missed, but what was that if the mortality were reduced from over 30 per cent. to under 10 per cent.

A short paper on the question

Are the Results of the Operative Treatment of Malignant Disease Better than Twenty Years Ago?

was read by Mr. Herbert J. Paterson (London), who pointed out that although there was no doubt that during the past quarter of a century surgical technique had greatly improved, and that many of the risks of operation had been materially lessened in spite of the fact that operations practised for malignant disease had become more extensive and radical, there was no convincing evidence that the proportion of ultimate successes was greater than was the case 20 years ago. The returns of the Registrar-General showed an increase in deaths from cancer, amounting to nearly 30 per cent. in the year 1921 as compared with the year 1900, and it was difficult to ascribe this increase entirely to the heightened incidence of cancer and to more accurate death certification. A review of post-operative statistics showed that the percentage of cases free from recurrence after 3 to 5 years was much the same now as it was 25 years ago, and this was true even where mammary cancer was concerned, in operations for which 20 years ago the axilla was not cleared out as a routine measure but only where there was evidence that the glands were involved. In connexion with this apparent lack of progress he would suggest the possibility that the teaching of pathology had been allowed to override clinical experience—e.g., cancer cells had been shown microscopically to be scattered far beyond the macroscopic limits of a growth, and therefore a wide and extensive excision was advocated—whereas clinical experience had shown that operations in which the margin of the growth was very close to the line of resection were sometimes followed by a long interval of immunity, a fact which suggested that the tissues could and often did destroy the isolated cells which were left behind beyond the line of excision. The efforts of modern surgeons had been directed towards more extensive operations, whereas earlier diagnosis and earlier operation should have been their aim.

Mr. Paterson also suggested that in modern surgery the lymphatic glands were attacked too ruthlessly, and that the part played by these glands in the defensive mechanism of the body was scarcely sufficiently appreciated. He recalled Crile's statement that remote visceral metastases were found in less than 1 per cent. of the cases of cancer of the head, face, and neck, and that the disease was almost invariably limited to the extensive collar of lymphatics surrounding the neck; but whereas Crile looked upon this fact as a clear indication of the necessity for the removal en bloc of these glands, the speaker believed this inference to be illogical, and urged that the barrier of glands should be left for several weeks after the removal of the primary growth. He had operated upon eight cases of carcinoma of the tongue by this method, one of whom died of broncho-pneumonia seven days after the operation, one died 15 months after the operation, one was untraced, and was assumed to be dead, while the remaining five were alive and well, four of them more than six years after the original operation. For the past three years he had adopted a similar method in dealing with cancer of the breast, but it was too early to judge of results. He submitted that there was solid justification for an extended trial of this procedure of operation in two stages whenever practicable—i.e., removal of the growth, followed at a later period by removal of the glands. He concluded by emphasising the necessity for a vigorous campaign to impress on the public the supreme importance of early recognition of the disease, and of early operation, which, so far as their present knowledge went, offered the only hope of cure.

THURSDAY, JULY 26TH.

On the second day, Sir Henry Gray (Aberdeen) again being in the chair, Mr. D. P. D. Wilkie (Edinburgh) opened a discussion on the

Treatment of Acute Primary Infections of the Hand,

including sequelæ. Mr. Wilkie began by pointing out the great importance of the subject both from a medical and from an economic standpoint, touching as it did the wide problems of infection, resistance, and immunity. He deprecated the tendency in hospital practice to look upon infections of the hand as belonging to the realm of minor surgery to be dealt with by the less experienced members of the staff, whereas not only did no class of case present more difficult problems, but also upon the line of treatment adopted the very life of the patient might depend. In discussing the subject there were certain fundamental pathological considerations that had to be borne in mind. The introduction of pathogenic micro-organisms into the tissues was followed by well-defined general and local tissue changes; but although these reactions were essentially protective in function, in the hand the outpouring of lymph and the local aggregation of phagocytes might, in areas in which space was limited, cause a high degree of tension, endangering the vascular supply and the vitality of the part. In addition to this, the concentrated toxins of the infecting bacteria, together with the proteolytic ferment liberated from the dead and dying phagocytes, tended to produce the death and liquefaction of the neighbouring tissue cells, and from such an area there would inevitably be a deleterious absorption of bacterial toxins and proteoses. The aim of surgical intervention was to provide for the drainage of such areas of suppuration and tension before the occurrence of irreparable damage; and in this connexion it was well to bear in mind that the disability following even an unnecessarily extensive incision was negligible in comparison with that resulting from a burrowing, liquefying, and prolonged suppuration followed by the inevitable fibrosis, fixing tendons and muscles, stiffening joints and compressing nerves and blood-vessels. The preservation of tissue without function was a mere waste of time and energy.

Anatomical Considerations.—There were three points in the anatomy of the hand that had an important bearing on the spread of infection in this region. (*a*) The extensive network of lymphatic vessels in the hand, especially on its palmar aspect. (*b*) The division of the cellular tissue into spaces. In the pulp of the fingers dense fibrous septa, extending down to the periosteum of the phalanx, enclosed the fatty tissue, infection of this tissue leading to great tension, with necrosis which was very apt to involve the bone. In the palm of the hand the two most important of the deep cellular spaces were the middle palmar and the thenar spaces. A collection of pus in the middle palmar space tended to point along the lumbrical muscles of the third, fourth, and fifth fingers; and in the thenar space it tended to point at the radial side of the index finger. A knowledge of the existence and boundaries of these spaces was essential for the early recognition and drainage of a collection of pus in either situation. (*c*) The anatomical arrangements of the tendon sheaths, owing to which any accumulation in them under tension was apt to rupture either into one of the palmar spaces or into the deep cellular planes of the forearm underneath the flexor communis digitorum, with the frequent sequel of infection of the first interphalangeal joints.

Types of Infection.—These were two: lymphatic and suppurative. In the lymphatic type the infecting organism was almost invariably the streptococcus, and the danger of septicæmia was a very real one. It was vital that a correct diagnosis should be made, as the treatment of such cases differed fundamentally from that of suppurating whitlow. The suppurative type occurred either as a cellulitis, or as a tendon-sheath infection, the former occurring mainly either in the tip of the finger or deep in the palm of the hand, and the latter either as a primary infection of the sheath from a direct wound, or as a complication of a lymphatic infection of a finger. The essential features of tendon-sheath infection were the early development of tension owing to the limited capacity for expansion possessed by the sheath, and the precarious nutrition of the structures within the sheath. A complication which may follow either of these types of infection—cellular or tendon sheath—was infection of the phalanges and interphalangeal joints.

Diagnosis.—The first essential in diagnosis was to decide which type of infection was present. In acute lymphatic infection there was marked constitutional disturbance, slight local swelling, swelling of the axillary glands, and red lines up the arms. In the suppurative type there was either (*a*) a localised swelling at the tip of the finger with tense and tender pulp, or (*b*) a slight prominence of the palm and marked œdema of the dorsum of the hand, with or without a swelling in the cleft between the fingers, or (*c*) a uniform swelling of the finger, flexed position, pain on passive extension and tenderness on pressure over the proximal part of palmar aspect of the finger, or (*d*) a combination of these according to whether or not the tendon sheaths were infected.

Treatment.—Great emphasis was laid upon the importance of prophylaxis in the shape of prompt antiseptic dressing of all wounds, especially in centres of organised industry. Where infection was already present the following principles were to be borne in mind: 1. The necessity for working with and not against Nature in her efforts to localise and limit the spread of infection. 2. The necessity for incising at the earliest possible moment where pus had accumulated under tension. 3. The necessity for making large incisions allowing of free drainage where spreading suppuration was present. 4. The importance of rest to an inflamed part. 5. The necessity for exercising the minimum of interference with the functional capacity of the hand compatible with the arrest and localisation of the infection. During the early stages of acute lymphatic infection no incision was ever to be made. The principles of treatment n these cases were to diminish absorption, to aid local resistance, to combat toxæmia, and, where possible, to give passive immunity. Bier's passive hyperæmia was probably the most valuable therapeutic measure n the acute lymphatic type, other auxiliary remedies being the giving of fluid in large quantities by mouth or rectum, and the subcutaneous injection of arge doses (50 c.cm.) of polyvalent antistreptococcic serum.

In suppurative cellulitis early incision with free drainage was always indicated. Two lateral incisions n the finger pulp would completely relieve tension, and, if made in time, would save the phalanx from necrosis. For deep suppuration in the palm it was necessary to make an incision in a cleft between two ingers and to thrust a sinus forceps in along a lumbrical anal. For suppuration in the thenar space, through-and-through drainage of the first interosseous space was essential. In the treatment of nail-fold infections where the pus had already made its way out under the old, the essential for rapid healing was to pack in trands of gauze between the nail and the fold with he blunt end of a straight sewing needle. In infective eno-synovitis free incision at the earliest possible moment under a general anæsthetic was necessary, a tourniquet in the shape of an Esmarch's bandage to the upper arm being advisable. It was a good rule to make all incisions sufficiently free to obviate the use of drainage-tubes, and so to limit the subsequent fibrosis. The after-treatment included moist dressings and hot saline baths until the subsidence of the acute inflammation. In cellulitis rest should be the rule until there was definite localisation of the infection, after which movement was to be encouraged. In tendon-sheath infections movements, active and passive, were indicated at as early a stage as possible, delay in instituting appropriate exercises endangering the ultimate utility of the hand.

Mr. C. M. **Page** (London) emphasised the importance of the subject from an economic aspect, and insisted that all such patients should be treated as in-patients and not as out-patients. He criticised Wilkie's classification in that lymphatic infections may be more or less chronic, and he preferred to call the severe cases fulminating streptococcal infections. He agreed that in these cases incisions were quite wrong and did a great deal of harm. In other types of infection the main object was to relieve tension by affording an outlet to the pus, and he did not consider the opening up of spaces by forceps advisable, as by this procedure tissues were often infected. The after-dressings were important, and he preferred dry gauze or paraffin gauze to wet dressings. With regard to the restoration of function in these hands, he found that if tendons had sloughed away plastic surgery offered very little hope of success in obtaining functioning tendons, but if the tendons were intact much could be done. He deprecated the common custom of treating these hands on a straight splint, for if adhesions formed it became impossible to get flexion of the fingers. They should always be treated half-way between flexion and extension, and then later full flexion could be obtained, either by graduated extension splinting or by breaking down the adhesions under an anæsthetic. He had found the paraffin bath very useful in the after-treatment of these cases, but he could not explain the rationale of the treatment.

Mr. F. D. **Saner** (London) thought that not sufficient attention was paid to prophylaxis of hand and finger infections, and he felt that it might be advisable to recommend immediate excision of all wounds and pinpricks. Whenever the patient had the premonitory symptoms the infection had already gained a foothold, and in such cases without actual pus formation he preferred large hot fomentations; and not until grave constitutional symptoms had supervened did he advise incision. He then called attention to the dilemma often confronting surgeons in the condition of the axillary glands. The problem of deciding on the necessity for incising axillary glands was a very difficult one; on the one hand, they formed an important line of defence; on the other hand, if suppurating, they must be opened. He believed that complete immobilisation of the whole limb was a very essential part of the treatment. The formation of pus was to be noted with relief, for pus was an indication of defence, and unless under tension was of no moment. He was not in favour of tubes or packs in his incisions, but he preferred to excise an ellipse of skin and fatty subcutaneous tissue so that drainage was not impeded.

Mr. J. E. H. **Roberts** (London) said that he would confine himself to the infections of the pulp of the finger in the distal part. He showed that in front of the distal phalanx there was a more or less closed area of loose fatty tissue, down to which ducts of glands reached, the gland often lying in this space. Infections of this part of the finger frequently arrived via the ducts without any prick or injury. The arrangement of the vessels was of great importance, for the artery traversed the space, and the blood-supply to the distal phalanx was arranged in this way. The artery supplying the base of the distal phalanx was given off before the artery entered the space, but those going to the shaft and extremity were given off in the space. This explained why it was that the shaft so often necrosed while the articular end survived. The incision he advised was one which completely opened the space; it was horseshoe-shaped, beginning on one lateral aspect, passing across the tip, and ending on the other lateral aspect. The flap so formed was turned down, and a strip of rubber tissue inserted and the flap replaced. Drainage was rapid and healing perfect. In those cases of acute fulminating streptococcal infections he was not enamoured of hot fomentations, but preferred hot baths for the hand and arm. In cases where the arm became swollen and painful, he thought that a linseed poultice was a very excellent application. In acute teno-synovitis he was entirely opposed to anterior median incisions, and strongly advocated lateral cuts. With regard to the after-treatment, he used hot fomentations for 48 hours, and then used paraffin and flavine dressings. In his opinion there was a widespread tendency to dress too frequently. Early movements were essential, and he agreed with Mr. Max Page that the correct position was one of semi-flexion.

Mr. R. M. HANDFIELD-JONES (London) confined himself to the discussion of the infection of two fascial spaces in the hand occurring as complications in the course of infections of the fingers, these spaces being the middle palmar space and the thenar space. After describing the boundaries and the relations of these spaces he enumerated the avenues of infection.

(*a*) *Middle Palmar Space.*—This might be infected in one of eight ways: from little finger tendon sheath (if not in continuity); from ring finger tendon sheath; from middle finger tendon sheath; from lumbrical canal of little, ring, or middle finger; from rupture of ulnar bursa; from direct puncture wounds; by lymphatic spread; from thenar space.

(*b*) *Thenar Space.*—This might be infected by: index tendon sheath; flexor longus pollicis sheath; middle tendon sheath (occasionally); index lumbrical canal; rupture of radial bursa; direct puncture wounds; lymphatic spread; middle palmar space.

The diagnosis was obviously of great importance, for if left untreated the infection would spread in almost every direction except towards the surface. General symptoms were those common to all severe infections. Local symptoms included: (1) Pain, limited to the area of the space involved. (2) Marked tenderness over the area concerned. (3) Swelling, the location and degree of which was the most helpful point in the diagnosis. In the thenar area where there was no dense fascia the thenar eminence became ballooned out; but in the middle palmar space the dense fascia prevented anything like the same degree of distension, although it was enough to obliterate the normal cavity of the palm. Swelling on the dorsum of the hand was a point of great importance. Every infection in the palm caused swelling of the dorsum, the inflammatory process travelling via the lumbrical canals. Except in direct infections of the back of the hand primary dorsal abscesses were extremely rare. This was an important point to remember, because frequently the dorsal swelling appeared to the untrained eye to be the most prominent feature of the case, repeated incisions being made without any improvement whatever to the hand. In 99 per cent. of cases no incision should be made on the dorsum at all, unless to open the thenar space. (4) Position and movement of the fingers which tended to be semi-flexed but could be moved without pain, thus differentiating the condition from an acute teno-synovitis. Treatment consisted of opening and draining the spaces. The middle palmar space was drained by an incision along one of the three lumbrical canals, the canal most obviously affected being chosen, the tendons exposed, and a pair of artery forceps thrust under them, following the lumbrical muscle. The thenar space was opened by an incision on the dorsum on the radial side of the index metacarpal. The after-treatment consisted of hot dressings for 36–48 hours, followed later by dry dressings with the hand immersed in a radiant heat bath for a period of one hour twice in the 24 hours, and a very early institution of movements of fingers, hand, and wrist.

Mr. G. T. MULLALLY (London) spoke entirely of whitlows of the fingers. He said that anatomically the fingers might be regarded as being composed of three compartments, for the flexion creases of the fingers coincided with fibrous tissue thickenings. In the presence of inflammatory swelling these fibrous thickenings were sufficiently rigid to act as a band strangulating the vessels, and he brought forward the view that the pathology was analogous to that of a strangulated hernia, first the veins being constricted, giving rise to swelling, throbbing and tension, and secondly, the artery being occluded, and necrosis followed. For this reason he was of the opinion that any incision planned to relieve tension in a finger should pass across the next proximal flexion crease to do away with the constriction band. He was still convinced that lateral incisions had no advantages over the anterior median incision which he always practised.

The PRESIDENT said that the surgery of the war had taught many lessons that were applicable to this subject. He thought that of prime importance was the properly placed incision at the earliest opportunity, and he felt very strongly that Willem's mobilisation treatment of infected joints was strongly indicated in septic fingers. Early active movements should be encouraged and maintained. He was convinced that in these cases there was too much splinting and much bad splinting.

Mr. HAROLD BURROWS (Portsmouth) said that he had been worried by septic phlebitis on more than one occasion, and that such complications as metastatic abscesses in hip and knee-joints, &c., were evidence of the presence of a septic thrombosis. He dressed his wounds with a paraffin-flavine dressing.

Mr. M. MAMOURIAN (Ashton-under-Lyne) drew attention to the ugly deformity which resulted after the loss of the greater part of the terminal phalanx, and emphasised the fact that women greatly objected to such an unsightly finger. He was in the habit of inserting an ivory peg exactly the same length as the sequestrated phalanx in such a way that it rested on the base of the phalanx, and was held in position by the flaps of skin being sutured over it. This was a sufficient support to prevent shortening of the flaps until the new bone had regenerated. In the case of the thumb in working men, he advised the insertion of a bone graft, rather than amputation which was the only alternative in certain cases.

Mr. WILKIE briefly replied.

Mr. A. MCCONNELL (Dublin) read a short paper on

Ventriculography,

giving his experiences in certain cases in which he had practised the operation as originally described in America by Dendy. The operation was performed under local anæsthesia, two areas of the skull being exposed. The first site (A), to be used for the injection, was 1¼ inches behind the external auditory meatus, and 1¼ inches above Reid's base line; the second site (B), to clamp the apparatus in position was 1¼ inches behind the external auditory meatus and 2½ inches above Reid's base line. At A the skull was exposed, and a small trephine hole made down to the dura mater; at B only the outer table of the skull was removed in a small circle. A semicircular bar connected the drill end at A, and the pin-holder at B. The pin was screwed tight to the skull, and the whole apparatus then closely applied so as not to shift. At A a perforated metal ball fitted closely to the trephine hole, and through its perforation the cannula was inserted in a straight line with B. The apparatus being thus firmly attached to the head, the patient was removed to the X ray department, and the injection proper begun. Great care was taken that the amount of gas injected was exactly equal to the amount of cerebro-spinal fluid removed. This was done by using a syringe with a two-way tap, sucking out cerebro-spinal fluid first and then injecting oxygen. Mr. McConnell showed excellent radiograms illustrating his results. In all he had performed ventriculography upon 14 cases. Of these five gave no result, and nine gave positive results of internal hydrocephalus, or deformities of the ventricular shadow from tumours,

&c. In two cases out of the 14, sudden death had occurred within 24 hours. In each case the patients appeared well, but suddenly sat up and fell back dead.

FRIDAY, JULY 27TH.

The third day was given up to a discussion on

Anæsthetics from the Surgeon's Point of View

in which both surgeons and anæsthetists took part. The opening paper was contributed by Mr. **WILFRED TROTTER**, who began by emphasising the necessity for a close and sympathetic understanding between the surgeon and the anæsthetist in order to secure for the patient the full advantages of modern surgery. He pointed out that since many of the most valuable methods of inducing anæsthesia at the present day—such as the various regional and infiltration methods—were definite surgical procedures in themselves there would probably be in the future a closer approximation of the training of the anæsthetist to that of the surgeon, and a more complete assimilation of the anæsthetist into the surgical team. Such an assimilation would probably go far towards solving some of the difficulties that arose in the relation between anæsthetist and surgeon in operations such as those on the face, pharynx, and upper air passages.

It was clear that in spite of the great progress that had been made within recent years in the subject of anæsthesia there was still no single method capable of general application to all cases. In every individual case the choice of an anæsthetic had to be made from a large number of possibilities, this choice frequently nvolving very careful consideration. He proposed o discuss in his paper only the methods with which he was himself familiar, classifying them in the three groups of inhalation methods, regional methods, and ocal methods.

1. *Inhalation Methods.*—(*a*) *Ether* was the nearest approach to an anæsthetic of general use, but with all its advantages it had many drawbacks considered rom the broad view of the patient's interests. These drawbacks included the over-stimulating effect of the drug on the circulatory and respiratory activities of he patient, adding seriously to the exhausting effect of the operation. It was irritating to the respiratory organs and to the stomach, leading frequently in the mmediately post-operative period to coughing and vomiting; and since the most absolute repose was ndicated for at least 24 hours after all serious operaions, a liability to cause post-operative vomiting hould be looked upon as a grave disadvantage in any næsthetic method. Ether was also contra-indicated n very severe or long operations which were apt to be followed by much shock. Its advantages were, ase of administration, immediate safety, and proundity of anæsthesia. (*b*) *Chloroform.* The numerous isadvantages of this drug included its immediate anger, the relative lack of depth in the anæsthesia produced, its irritant effects on respiratory and gastric mucous membranes, and its capacity for producing the o-called delayed chloroform poisoning. Chloroform was absolutely inadmissible in infants and children in ll circumstances; it should not be used for robust nd young or middle-aged adults unless specially ndicated; nor should it be used for trivial operations r "casual" anæsthetics. Chloroform was also ontra-indicated in young people suffering from acute r chronic infections, in patients suffering from malutrition or starvation, and in diabetics. In spite of ll these disadvantages and contra-indications, hower, chloroform was valuable and, indeed, indispensble in certain fields. It produced a smooth and placid næsthesia; it was useful in cases where any increased urgescence in the respiratory tract was to be depreated; and it was almost absolutely safe when given hrough a laryngotomy or tracheotomy opening. lthough chloroform was not usually admissible in erious abdominal work, it had a great field of usefulness n operations on the mouth, jaw, larynx, and pharynx, nd in his own practice this was the anæsthetic nployed in all such cases, almost invariably in combination with laryngotomy or tracheotomy. Chloroform was also valuable in many brain and spine operations and for the radical operation for carcinoma of the breast. (*c*) *Nitrous oxide* was incapable of producing a deep anæsthesia in any but delicate or enfeebled patients unless it was supplemented by local or regional anæsthetisation of the part to be operated upon, its efficacy being also increased by preliminary hypodermic injections of morphine.

2. *Regional Methods.*—(*a*) *Spinal anæsthesia* was unsuited to enfeebled patients and to those with acute and serious abdominal conditions. Its special indications were in operations on the lower limbs, perineum, pelvis, and lower abdomen where shock was to be feared; where metabolic disturbances were to be avoided, as in diabetes; and where full abdominal relaxation was essential. Spinal anæsthesia should generally be preceded by narcotic drugs and might usefully be combined with the use of nitrous oxide. (*b*) *Sacral anæsthesia*, in combination with narcotics, was valuable in operations on the perineum, and was specially indicated in operations for piles. (*c*) *Nerve tissue anæsthesia.* Two special forms of this were in common use; the blocking of the intercostal nerves for operations upon chest and abdomen, and blocking of the brachial plexus above the clavicle for operations on the arm. The complementary use of narcotics and possibly of nitrous oxide should always be considered.

3. *Local Methods—Infiltration Anæsthesia.*—The two chief spheres of usefulness for this method were (*a*) in such conditions as superficial, definitely limited dissections, in radical cure of hernia, especially inguinal and umbilical, and in excisions of the testicle; and (*b*) as a special procedure where other methods were urgently contra-indicated. In the hands of the expert it was capable of application to almost any surgical operation save where diffuse infective conditions were present. The main factors for its successful employment included the preliminary use of narcotics, the injection of an abundance of solution, and allowing full time for its action.

Sir **W. I. DE COURCY WHEELER** (Dublin) said that he would have entitled this discussion, "The Anæsthetist and the Surgeon." He was sure that in the minds of all present the picture was vividly present of an emergency abdominal operation with an inefficient anæsthetist—the rigid muscles, the protruded intestines, the harassed surgeon. He did not suggest that the surgeon was always free of blame, for not all surgeons were gentle, and a ruthless hand under the diaphragm could upset any anæsthetised patient, and again, some surgeons were invariably in too great a hurry to begin. Many things went to make a really successful anæsthesia—viz., a consideration of the nature of the operation, the type of patient, the temperament of the surgeon, and a sound judgment throughout. He asked to make three points especially. First there was the patient who, without any obvious cause, collapsed, stopped breathing, and gave all concerned many anxious moments. In these cases the abdomen was usually opened and perhaps an investigation just commenced. Artificial respiration usually had to be resorted to. He wished to stress the fact that all the ordinary methods could not, and should not, be applied. He advocated very strongly a return to the old direct method, by blowing into the patient's lungs. This should be done rhythmically once every four seconds, and very rarely failed. He quoted the classical early example of direct artificial respiration—viz., Elisha and the widow's son. Secondly, he thought that chest complications ought not to be laid at the door of the anæsthetist, for he thought that the rigidity of the diaphragm had much to do with the onset of so-called ether bronchitis and ether pneumonia. He recalled that the late J. B. Murphy had drawn attention to the incidence of acute pulmonary œdema as a complication of operations for large hernias, &c., and had ascribed it to the want of descent of the diaphragm. In many upper abdominal lesions (especially acute ones) the diaphragm was held rigid just as the recti were, and for this reason in doubtful cases he thought that the presence of crepitations at the base of a lung was an indication that the condition was an abdominal one rather than a pulmonary. Lastly, he said that for 20 years he had been in the habit of combining local anæsthesia with general, for the abdominal relaxation obtained was far superior and less general anæsthetic was required. He ended by expressing his complete detestation for chloroform.

Dr. A. L. **Flemming** (Bristol) referred to the somewhat prevalent habit of mutual recriminations that occurred between surgeon and anæsthetist, and he was pleasantly surprised that at this meeting he was not called upon to retaliate in kind. But he was quite certain that there was a very great need for a much closer contact between the surgeon and the anæsthetist. Many points arose which could be settled by consultation, but in so many cases the two seemed poles apart and no combined effort was obtained. He was of the opinion that ether was the most satisfactory anæsthetic if the surgery was gentle, rapid, and dry. He considered that the administration of local anæsthetics by anæsthetists was absolutely useless unless a complete accord existed between them and the surgeon. What was the good, he asked, of an anæsthetist inducing a perfect local anæsthesia for the proposed operation, if the surgeon regarded the patient somewhat in the way that the pathologist does a body awaiting a post-mortem examination? He wished to lay stress upon the fact that the teaching of anæsthetics needed great revision, and should be markedly improved.

Dr. A. E. **Boyd** (Dublin) confined himself almost entirely to colonic anæsthesia. He said that the bad results in this country were due to the use of too high a percentage of ether in the ether oil mixture. He followed Gwathmey's technique very closely except for the mixture. For many months he had used a 50 per cent. ether oil mixture and had had no evil effects. He found it quite safe, very easily controlled, and was followed after operation by a dreamy analgesia. A careful preparation was needed, and consisted of an enema the night before and a rectal irrigation the next morning. The amount to be used must be carefully checked. Of the 50 per cent. mixture he used 1 oz. for each 20 lb. body-weight of the patient. He gave $\frac{1}{6}$ or $\frac{1}{4}$ gr. morphia half an hour before the injection, which had to be given slowly. At least 15 or 20 minutes was necessary for the introduction of the mixture. This mixture did not produce surgical anæsthesia, and here the control came in, for the balance was just tipped over on to the side of surgical anæsthesia by small amounts inhaled from a mask. The period over which the absorption from the large bowel lasted was one and a half hours, so that longer procedures would require rather more inhalation at the end. When the patient returned to bed the colon was washed out, and 2 oz. of olive oil injected. He considered that all head, neck, and breast operations should be done by this method. He also mentioned that all his diathermy cases of the tongue, tonsil, and mouth were done by this anæsthetic.

Mr. A. **McConnell** (Dublin) said that colonic anæsthesia as described by Mr. Boyd was the best he had known, and he did all his operations upon the neck, brain, breasts, and diathermy by this method.

Mr. **Cuthbert** (Gloucester) favoured local anæsthesia for all head cases.

Mrs. **Dickinson Berry** (London) thought that ether anæsthesia if kept light did not produce an undue stimulation, but rather just enough to stand the patient in good stead. She was greatly in favour of combining local anæsthetics with a slight general administration.

Dr. **Basil Hall** (Bradford) said that he was all in favour of simplicity in the administration of anæsthetics, and he mistrusted all the modern apparatus with complicated machinery. No hard-and-fast rules were possible, nor was any apparatus of the least value which dealt only with fixed percentages. What he personally wanted was an anæsthetist who was able to judge each patient separately and deal with according to the condition found. Half the battle in operative surgery was to establish a team with an intimate knowledge of each other. He thought that anæsthesia was often pushed quite unnecessarily far. His experience of ethanesal has been most satisfactory, and he now preferred it to all others. He emphasised the fact that for the patient by far the worst part of an operation was the anticipation of the anæsthetic.

Sir **Crisp English** (London) had three remarks to make. First, he had tried ethanesal for two years with admirable results, and this July he had arranged with his anæsthetist to go back to ordinary ether for one month as a control. There was no doubt in their minds that ethanesal was superior in every respect. Secondly, he advocated the induction, especially in children, by ethyl chloride. The induction is very rapid, and all the long struggling excitable period was omitted, and he thought that in children this was exceedingly valuable. Lastly, he thought that in the hands of such experts as Mr. Boyle, gas and oxygen was an extremely useful anæsthesia, and there were many cases which were safely dealt with by it which would not stand a more toxic drug.

Prof. C. A. **Pannett** (London) drew attention to a condition of delayed ether shock which was not infrequently seen after ether anæsthesia. He mentioned cases leaving the table in good condition only to be in a condition of severe collapse three hours later. He did not find it possible to acquit the anæsthetist of all responsibility for lung complications, though he liked Sir W. I. de Courcy Wheeler's explanation of such cases. And lastly, and most important, he had been attempting lately at St. Mary's Hospital paravertebral nerve-block anæsthesia with good results. The technique was not yet perfected, but it was being made so; he had already done partial gastrectomies, cholecystectomies, &c., under paravertebral anæsthesia.

Mr. **Trotter** briefly replied.

Mr. **Clifford Morson** (London) read a short paper in which he explained his method of, and reasons for, division of the vasa deferentia in operations upon the prostate.

SECTION OF PUBLIC HEALTH.

Thursday, July 26th.

This section, which met on two days, was presided over first by Dr. A. **Mearns Fraser** (M.O.H., Portsmouth) and then by Dr. **Lockhart Stephens** (M.O.H., Warblington U.D.). A discussion on factors contributing to the

Recent Decrease in Infant Mortality—

Are such factors likely to be permanent or temporary? —was ably opened by Dr. J. **Wheatley** (M.O.H., Salop). His main conclusion was that the fall of the infant mortality-rate had been due chiefly to education. The earlier part of the fall was probably due to the operation of the Education Act of 1870 in increasing the intelligence of the people and the sense of responsibility of parents. One would not expect an immediate effect from the Education Act but rather an effect delayed for about a generation, and that was what had actually happened, the fall having begun in 1900. The latter part of the fall was probably due to the continued effect of better general education, aided by special education influences, brought to bear more particularly on the mothers, such as by child welfare, tuberculosis and school medical inspection schemes, and by the establishment of district nurses.

Dr. Wheatley's paper was illustrated by tables and charts showing infant mortality rates from 1840 onwards, giving the dates of introduction of various measures likely to affect it. The various possible factors were discussed. The fall in the birth-rate began in 1880, but up to 1900 had not improved infant mortality. The same could be said of the improved sanitation which followed the passing of the Public Health Act of 1875 and coincided with a con-iderable fall in the general death-rate. The great icrease in prosperity and in the purchasing power of he wage which took place in the latter part of the ineteenth century had no effect ; in fact, the evidence vent to show that improvement in wages without nprovement in education and standards of conduct esulted on the whole in more drunkenness, a greater arelessness, lessened natural feeding of infants, and consequent increase in infant mortality. From 1840 ɔ 1900 the purchasing power was trebled, with no eduction of infant mortality, while from 1900 to 1913 iere was a slight decline in purchasing power with a ery large reduction in infant mortality.

The removal of slums had been on too small a scale ɔ be an important factor. From 1914 to the present me there had been a cessation of sanitary schemes, marked deterioration of housing, and a lessened ficiency of sanitary administration, accompanied, evertheless, by a very marked diminution of infant iortality. He (Dr. Wheatley) did not wish to belittle ich important matters as the pollution of the air by noke, overcrowding, and bad housing, but these were ily very specially potent when combined with ignor- ace and carelessness, and it was this combination hich caused the high rates in northern industrial ɔwns. He believed with Dr. Brend that air pollution iused an excess of infant mortality, but there had been ɔ improvement in this respect to account for the duction in the latter. He did not think the decline as due to an improved milk-supply, in rural districts any rate, or that the use of dried milk had been ifficiently general to be a large factor.

Ante-natal work was more a thing of the future and id not appreciably affected neo-natal mortality as et. There was no evidence that the improvement was ie to a change in climatic conditions. Between the nsus of 1901 and that of 1911 there was an increase the number of married women industrially employed id the figures for 1921 were not yet published. essened horse traffic and tarred roads meant fewer es and more open windows, and had no doubt been nong the minor contributory factors. As regards the ture, he thought the improvement would be per- anent and progressive. If the fall had been due to ild winters or periodicity of infectious diseases, we ight have real set-backs, but there was nothing inting to this, and apart from temporary set-backs used by epidemics of influenza, measles, whooping- ugh, &c., the improvement, in his opinion, would be ogressive as long as education kept ahead of material lvancement.

In the discussion which followed Dr. H. PECK [.O.H., Chesterfield R.D.) agreed generally with Dr. heatley, but thought privy conversion was one nitary measure which had had an effect. He also stanced the good effect of "Summer Time" and the eaner air during the coal strike. Dr. H. B. BRACKEN- RY (London) was sceptical as to the good results of aternity and child welfare work. He thought the v mortalities in Connaught, mentioned by Dr. heatley, were remarkable, and he suggested the bulation of districts according to their varying nditions. Dr. D. C. KIRKHOPE (M.O.H., Tottenham) ought the education of the mother in her home was e most important form of education and that the rk of the centres was vital. Dr. G. C. TROTTER .O.H., Islington) thought home visitation was *the* ing. It was not only the primary education that d been important but the educative effect of working- ss movements which operated all through life. . J. W. MILLER (M.O.H., Radnorshire) thought ucation by health visitors had been important by couraging breast-feeding. Education in domestic giene in schools was not practical. Education in the mes and by centres was extremely important. . G. HARPER PEARCE (M.O.H., Batley) said smoke d increased as infant mortality decreased. Education the mothers and the use of dried milk had been the ef causes of the decrease. Dr. W. A. BULLOUGH .O.H., Essex) thought the district nurse-midwives d been important educators. Dr. H. SCURFIELD te M.O.H., Sheffield) said the Irish Carnegie report emphasised the freedom of the Connaught mothers from venereal disease and abuse of alcohol. It was also possible that a religion which placed motherhood high had maintained its hold on a population undegraded by the agricultural and industrial revolutions which occurred in England during the reign of George III. He was in general agreement with Dr. Wheatley but attributed more importance to the use of dried milk, and mentioned the opinion of the late Dr. Ewart that the increasing use of a safe milk had been the chief factor. The teaching of housecraft was considered important by many, but always suffered if the Education Committee's estimates had to be cut down. The new midwifery would produce an effect on neo-natal mortality when it got going. Prof. F. E. WYNNE (M.O.H., Sheffield) said an investigation made by him recently showed that most of the Sheffield infant mortality reduction was in diarrhœal diseases. His belief was in the special education of the mothers. The teaching of domestic hygiene in the schools was not a practical form of education.

Dr. WHEATLEY, in replying, said he had limited himself to those factors which, in his opinion, had had a possible effect in causing the decrease in infant mortality. Heredity was obviously not one of these. He could not understand anyone minimising the effect of education. In reply to Dr. Brackenbury he thought the maternity and child welfare schemes had produced a great and immediate effect as contrasted with the delayed effect of improved general education.

Dr. SCURFIELD read a paper on

The Value of Watercress

as a food, and suggestions for its extended use, which evoked considerable interest. In his preliminary remarks Dr. Scurfield drew attention to the proved importance of a vitamin-rich diet not only for laboratory animals but for animals such as pigs, poultry, and dogs kept under ordinary conditions, and the obvious inference that the same held good for human beings if they wanted to be at their best. There was just the danger that people would get sick of the talk about vitamins before they had absorbed the comparatively simple teaching of the newer nutrition—viz., that they needed to include more of the "protective foods"—i.e., milk, green vegetables, and fruits—in their dietaries. Watercress was a green food which had stood the test of time and had a great reputation as a promoter of health. It was certainly, like other cruciferæ, a valuable antiscorbutic. It probably also contained the other two vitamins. He hoped research would be undertaken both as to its chemical and vitamin content. It was a green vegetable, which, like lettuce, was eaten unspoiled by cooking, but which, unlike lettuce, was available all the year round at a moderate price. If there was to be an extended use of it inspection of the sources of supply was desirable. Such inspection would be welcomed by the large growers, who from his experience took great care at the present time with respect to purity of water, &c. In his experience most people, including children, liked it, but many only met it in railway dining cars or as a garnish to chicken, &c., in a restaurant. It was much more used in France, and in his belief its more extended use in this country would be useful in correcting errors in our dietaries due to urbanisation.

FRIDAY, JULY 27TH.

The second day's proceedings opened with a discussion on the

Effect on Health of Sewer Air and Drain Air,

introduced in an interesting paper by Prof. WYNNE, the gist of whose paper was to the effect that the theory of the harmful results caused by sewer and drain air was founded on quite unsatisfactory evidence. Actual infection of human beings by pathogenic micro-organisms carried from the sewage by sewer or drain air was now considered practically impossible, but the theory founded on very flimsy evidence that the inhalation of sewer or drain air lessened the resistance to infection remained.

In the discussion which followed there was a considerable amount of agreement with Dr. Wynne that too great importance had been attached to the harmful effects of sewer and drain air in the past, but the general opinion seemed to be that more research should be undertaken and that we must move cautiously till the subject is better understood. Dr. MEARNS FRASER mentioned that many practitioners attached importance to defective drainage as a cause of certain diseases. He asked why polluted soil did harm if drain air was harmless. Dr. A. WYNTER BLYTH gave the results of experiments conducted by him on the conditions under which micro-organisms can be discharged from sewage into the air. He had experimented with froths, bubbles, and splashes, and had found that a bursting bubble could only throw a micro-organism a distance of 4–6 inches. Whether a micro-organism so thrown could be carried along in a draught of air depended upon whether it was nude or covered with liquid. If nude it might be carried some distance in a light draught. Dr. Blyth advocated further research and that conclusions be not hastily accepted. Dr. SCURFIELD also favoured further research. It would be necessary to convince the Ministry of Health and its architectural department before by-laws could be altered. He had for 20 years advised his health committee that such diseases as typhoid fever and diphtheria could not be caught from drain or sewer air, but that health might be lowered by their inhalation so as to lessen resistance to infection. If drains were not watertight, leakage of sewage into or under the foundations of a house might go on for a considerable time without being spotted. Dr. A. MANKNELL (Bradford) mentioned the widespread belief aroused in the mind of the public by such books as Mr. Teale's, and pointed out that it was very necessary for the general practitioner to have a lead if there was to be a change of front. Dr. J. A. R. GLENNIE (Singapore) thought that the harmful effects put down to drain air might be due to rats. Many other speakers spoke as to the need for caution.

Prof. WYNNE, in replying, said he regarded sewage-polluted ground as a distinct danger. Traps were necessary to make drains rat-proof. Comparing drains with privies, the danger from a privy was not due to the smell, but to flies and the fouling of the streets at emptying times. Medical officers of health required guidance in this matter from scientific research workers like Dr. Blyth. He did not wish to be dogmatic, but we ought not to be satisfied with the vague idea that drain or sewer air lowers health and so causes disease.

Dr. E. B. HAZLETON (Sheffield) followed with a paper on the effect of long-continued inhalation of small doses of

Coal Gas in Causing Ill-health,

and especially in predisposing to tuberculosis. Since his attention had been drawn to the matter he had found that small leakages of coal gas were very common owing to defective construction of the taps. The taps which were at fault were those with stop-cocks at the bottom of the pipe. He had remedied the matter in his own house by adopting a catch which secured a gas-tight tap when the gas was turned off. He attributed the mischief to carbonic oxide, and had found that a leakage, quite insufficient to arouse attention by the characteristic smell, would at the end of the night give rise to a percentage of carbonic oxide in the bedroom, easily detectable by chemical analysis. He believed that the exposure to such air produced headache, anorexia, &c., and ultimately anæmia and he had had several striking cases in which tuberculosis was the ultimate result.

In the discussion which followed most of the speakers agreed that the matter was important and that there was much negligence on the part of householders in securing gas-tight fittings, and the hope was expressed that medical officers of health would follow up this question with a view to seeing if leaky gas taps are as common in their districts as in the experience of Dr. Hazleton.

EXHIBITION OF INSTRUMENTS, DRUGS, FOODS, AND APPLIANCES.

We have already commented on the excellence of the exhibition of surgical instruments, appliances, drugs, foods, and other objects which was held in the gymnasium of the Royal Naval Barracks at Portsmouth from Tuesday, July 24th, until Friday, July 27th. In the summary which follows notice is taken of exhibits presenting some new feature, the number of the stand being given for reference in square brackets.

SURGICAL INSTRUMENTS AND APPLIANCES.

The exhibit of surgical instruments, general and special, was particularly full and instructive. [52] John Bell and Croyden, Ltd., incorporating Arnold and Sons (50, Wigmore-street, London, W. 1): showed operating tables and hospital furniture, finished with a special non-chip enamel. Prominence was given to operation and accouchement outfits, to sterilised dressings, and to the "Marylebone" series of sutures and ligatures.—[63] Down Bros., Ltd. (21, St. Thomas's-street, London, S.E. 1): a large selection of new instruments, introduced and modified from existing patterns at the suggestion of operating surgeons, including Albee's instruments for bone grafting, Childe's hernia director and finger guard, Mott's dosimetric intratracheal anæsthesia apparatus, Carruther's saline infusion apparatus with unbreakable vacuum flask, and blood-urea instruments.—[36] The Genito-Urinary Manufacturing Company, Ltd. (66, Margaret-street, London, W. 1): the latest cystoscopes by Thomson Walker, Joly, Kidd, Andrews and Gordon, with urethroscopes by Joly, Powell, Kidd, Harrison and Young, also suprapubic drainage apparatus by Eynard, of Paris.—[65] The Holborn Surgical Instrument Co., Ltd. (26, Thavies Inn, London, E.C.): besides general surgical instruments and hospital furniture, a selection of glass and enamelled ware, a very complete assortment of midwifery bags, and an interesting collection of diagnostic apparatus, including the Holborn "pantoscope" for ear, nose, and throat examination, with additional attachments for trans-illumination of the frontal sinus and examination of the fundus oculi.—[17] Mayer and Phelps (59, New Cavendish-street, London, W. 1): a selection of instruments of original design for general and regional surgery, including the Revel-Moseley electric rotary pump for pressure and suction, available for removing blood and secretions from the operation area and for aspirating the chest and evacuating cysts. Among the intruments were Gillies's instruments for plastic surgery, Platt's chisels for operating in osteo-arthritis, and Walton's support for ptosis and after abdominal section.—[38] John Weiss and Son, Ltd. (287, Oxford-street, London, W. 1): a selection of instruments for use in general and ophthalmic surgery, calling particular attention to a new shadowless lamp for operation purposes.

Among the special instruments:—[29] "Acoustique" (95, Wigmore-street, London, W. 1): the "aid to hearing" in 25 distinct types as well as the acoustique stethoscope for doctors suffering from deafness, and an installation to enable deaf members of a congregation to hear the service.—[3] H. E. Curtis and Son, Ltd. (8, Old Cavendish-street, London, W. 1): various forms of abdominal belt and support, including an arrangement for colostomy, as well as "colonol," a liquid paraffin of Russian origin with a S.G. of 0·885 and viscosity of 295 to 300 secs. at 100° F.—[11] The Dowsing Radiant Heat Co., Ltd. (91, Baker-street, London, W. 1): the latest form of apparatus for radiant heat treatment by apparatus which is supplied on hire to medical men and institutions for any length of time.—[28] Horace V. Duncan (117, Commercial-road, Portsmouth): a number of original designs in artificial limbs, the "Victor" models being especially light in weight as well as silent and perfect in movement.—[19] Lindsay and Sons (7, Commercial-road, Portsmouth): abdominal belts, electric trusses, artificial limbs, appliances, and dressings as supplied to the Royal Portsmouth Hospital.—

] Watson and Sons (Electro-Medical) Ltd. (43,
arker-street, Kingsway, London, W.C. 2): the
Sunic " X ray outfit for private practitioners and
ottage hospitals, an oil immersed transformer type
mploying a 30 milliampère Coolidge tube in conjunc-
on with a combined couch and screening stand.—
] X Rays Limited (11, Torrington-place, London,
.C. 1): the latest design of combined couch and
reening stand, affording complete protection for
oolidge tube to comply with the standard set up by
e X Ray and Radium Protection Committee. The
nds of the box are covered with 9 mm. lead rubber,
e sides with 3 mm. of the same, and outside all is a
yer of 3 mm. of metallic lead.

Besides those firms mentioned as supplying dress-
gs:—[33] Antiphlogistine (Denver Chemical Mfg.
o., London, E. 3): the well-known product in the
ature of a hygroscopic antiseptic poultice, non-
ritating and non-toxic, keeping well in any climate
nd ready for immediate use.—[14] The Thermogene
ompany, Ltd. (Haywards Heath, Sussex): A
ientifically prepared cotton-wool impregnated with
imulating medicinal essences adapted for use as an
algesic and counter-irritant.

Drugs and Pharmaceutical Preparations.

The collection of drugs and pharmaceutical prepara-
ons was large and representative:—[2] Allen and
anburys, Ltd. (37, Lombard-street, London, E.C. 3):
erapeutic sera and vaccines issued by the Lister
stitute, as well as a number of organo-therapeutic
oducts, insulin, A.B. brand (manufactured jointly
ith British Drug Houses, Ltd.), a complete range of
oup-test protein solutions to be used in the diagnosis
hay fever, urticaria, &c., an efficient spirochæticide
the form of novarsan, and "butyn" a new local
æsthetic not coming within the scope of the
angerous Drugs Act. The same firm also showed
rgical instruments and appliances.—[69] Anglo-
rench Drug Company, Ltd. (238a, Gray's Inn-road,
ondon, W.C. 1): special pharmaceutical preparations
ch as diabetylin for the treatment of diabetes without
e withdrawal of carbohydrates, dimol, the intestinal
sinfectant introduced by Captain Ainslie Walker;
dyl, an arsenical compound for syphilis, approved by
e Ministry of Health, and neo-trepol, an anti-
philitic containing 96 per cent. of bismuth in isotonic
edium.—Modern Pharmacals, Ltd. (2, Calthorpe-
reet, London, W.C. 1): glucarsenol, a solution of
varsenobenzol in glucose with analgesics, in
npoules ready for use.—[45] Bayer Products, Ltd.
, Worple Way, Acton Vale, London, W.): a large
llection of synthetic drugs, among them adalin, a
pnotic and sedative, for use in neurasthenia, cardiac
uroses and pertussis, luminal and luminal-sodium,
datives in epilepsy, chorea and drug habit, nov-
pirin, protargol, sajodin, tannigen, veronal, and a
eparation designed to stimulate fibrosis in tuber-
lous conditions, known as guycose, being a 5 per cent.
lution of guaiacol-calcium-sulphonate in liquid
matose.—[67 and 68] John Bell and Croyden Ltd.:
isplay of "ramul" and "ramulettes," the ready-for-
e barium meal in X ray diagnosis, B and C brand
lysol, and "malobin," a children's tonic, being a
mbination of colloidal iron, red bone-marrow, and
alt extract.—[12] Boots Pure Drug Company, Ltd.
ottingham): a large assortment of synthetic and
edicinal chemicals, including acriflavine in crystal-
e form; stabilarsan, being a stable combination
salvarsan and glucose; alanin, uradal and others;
mpressed tablets of medicinal drugs and chemicals;
lution tablets in distinctive form for external
plication; flexible capsules and pastilles.—
7] C. J. Hewlett and Son, Ltd. (35, Charlotte-
eet, London, E.C. 2): a series of original
eparations, including deliciol, a soft paraffin for
estinal lubrication, iodermiol, a non-staining
eparation of iodine, physiologically standardised
ctures of ergot, digitalis, cannabis indica, scilla and
ophanthus, and a hypnotic, somnogen, an opium
eparation free from disagreeable after-effects.—
] Newton, Chambers and Co., Ltd. (331, Gray's Inn-road, London, W.C. 1): izal disinfectants, powders, soaps, along with mechanical sprayers.—[42] Oppenheimer Son and Co., Ltd. (179, Queen Victoria-street, London, E.C. 4): palatinoids and pulverettes, a series of colloids known as "oscols," standardised both microscopically and bacteriologically, roboleine, a reconstructive food for infants and invalids, and "pinheroin," a combination of terpene, heroin, and Canadian pine for use in laryngitis and chronic bronchitis.—[66] Parke, Davis and Co. (50, Beak-street, Regent-street, London, W. 1): pharmaceutical preparations including adrenalin gauze tape, medicinal peptone for use in cases of hypersensitiveness, mercurosal, a soluble organic mercury for injection, and protein extracts for diagnosis in more than 100 forms; also bacterial vaccines prepared at St. Mary's Hospital and antidiphtheritic serum of high concentration.

A number of special pharmaceutical preparations were shown. [81] The Anglo-American Oil Co., Ltd., Albert-street (Camden Town, London, N.W. 1): nujol, an intestinal lubricant of undeviating standard of viscosity; miscol, a solution of menthol, camphor, and eucalyptol in liquid paraffin for use in an atomiser in catarrhal affections and hay fever.—[56] Armour and Company, Ltd. (Queen's House, Kingsway, London, W.C. 2): digestive ferments, glandular preparations, and a glycerine extract of red bone marrow.—[41] G. W. Carnrick Co.'s standardised gland products (American Drug Supply Co., Ltd., 40, Lexington-street, London, W. 1): a series of organo-therapeutic products, selected from the glands of healthy food animals, such as hormotone for menstrual and menopausal disorders, trypsogen for diabetes mellitus, secretogen for gastro-intestinal disorders, and kinazyme in malnutrition.—[78] The Crookes Laboratories (22, Chenies-street, London, W.C. 1): along with other colloidal products, the recently introduced collosol-calcium for use in tuberculosis, malnutrition, and chronic sepsis, and collosol-kaolin in the treatment of intestinal toxæmia.—[20] The Danish Medicinal and Chemical Co., Ltd. (John Morgan Richards and Sons, Ltd., 46, Holborn Viaduct, London, E.C. 1): a concentrated pepsin-extract prepared and standardised by Dr. Ege. of Copenhagen University, citric acid tablets for achlorhydria, and various soft-mass pills containing an assimilable form of iron known as ferrolyt.—[13] J. C. Eno, Ltd. (Victoria Embankment, London, E.C. 4): a well-known effervescent saline laxative to assist in correcting some of the inevitable consequences of a civilised and artificial life.—[34] Genatosan, Ltd. (Loughborough): sanatogen, a true organic compound of casein and sodium glycerophosphate; genasprin, a pure form of acetyl-salicylic acid, cystopurin, and detoxicated vaccines including protein fractions of various bacteria.—[48] Jeyes' Sanitary Compounds Co., Ltd. (64, Cannon-street, London, E.C.): preparations of cyllin, characterised by high bactericidal power and slight toxicity, including inhalation, capsules, pastilles, dusting powder, and surgical soap; also Jeyes' lysol (jeysol), for use when a clear solution in water is required.—[44] The Chas. H. Phillips Chemical Co. (179, Acton Vale, London, W. 3): milk of magnesia, an antacid containing not less than 26 fluid grains of magnesium hydrate to the ounce, for use in milk modification and as a mild aperient; phospho-muriate of quinine compound, being an aromatic syrup for use as a general and nerve tonic.—[83] The Sandoz Chemical Co., Ltd. (Canal-road, Bradford): scillaren, being the cardiotonic glucoside of squill in tablets and ampoules; femergen, a new preparation of ergot free from unpleasant taste or smell; felamine, a combination of biliary acids of ox gall and hexamine for affections of the biliary system.—[82] Savory and Moore, Ltd. (143, New Bond-street, London, W. 1): the well-known food containing vitamins and approximating closely in composition to human milk; a new anæsthetic, ethanesal, containing ketones treated with CO_2 and ethylene dissolved in ether, and the fructole series of pharmaceutical preparations flavoured with a fruit base.—[23] The Semprolin Company, Limited (18, Leather-lane, London, E.C. 1): an emulsion containing

60 per cent. of paraffin oil of high viscosity; a special emulsion for infants with addition of carminatives known as carmex, and O.T.P., an oxygenated tooth-powder with a soluble base giving off nascent oxygen when moistened.

Toilet preparations were shown by several firms. [43] D. and W. Gibbs, Ltd. (Wapping, London, E. 1): superfatted soaps for tender and sensitive skins, various kinds of medicated soap, dentifrice, and dental cream.—[58] Kolynos Incorporated (Chenies-street, London, W.C. 1): an antiseptic dental cream capable of destroying pathogenic bacilli in the mouth as well as in vitro with no grit to abrade the enamel.—[55] The Pepsodent Company (42, Southwark Bridge-road, London, S.E. 1): a mildly acidic dentifrice containing acid calcium phosphate, stimulating the flow of saliva and removing mucin plaques, the polishing agent being tri-calcium phosphate.

(To be continued.)

Obituary.

FLORA MURRAY, C.B.E., M.D., B.S. DURH., D.P.H. CAMB.

Dr. Flora Murray, who died in London after a short and unexpected illness on July 28th, will be remembered for her large share in founding and maintaining the Women's Hospital Corps.

Flora Murray came from Dumfriesshire where her family have lived for over 500 years. Her father was Commander John Murray, R.N., of Murraythwaite, and her brother, the late Major Murray, was M.P. for Dumfries county. A student of the London School of Medicine for Women and of the College of Medicine, Newcastle-upon-Tyne, Dr. Murray graduated in medicine and surgery at Durham in 1903, proceeded to the M.D. degree in 1905, and a year later took the D.P.H. at Cambridge. Among the various appointments which she held after qualification were those of assistant physician to the Crichton Royal Institute, Dumfries, clinical assistant at the Belgrave Hospital for Children, and anæsthetist to the Chelsea Hospital for Women. She entered upon general practice in Kensington, throwing herself into her professional work with characteristic energy and devotion. In 1911 she founded a hospital for children in the Harrow-road, consisting of an out-patient department which extended rapidly, and of a ward of 12 beds. It was her hope later to build and to raise an endowment for an adequate hospital as a training centre for medical women in children's medicine. But the war intervened and expansion proved impracticable. Greatly to her regret, and that of the committee which she had gathered round her, the hospital was closed in 1921, after having done valuable work for ten years. The money collected for the hospital, mainly by her own efforts, amounted to £31,000, and has now in large part been vested in a trust under the name of "The Sea and Sun Club" for providing holidays and convalescent treatment for children of the neighbourhood.

A few days after war broke out in August, 1914, Dr. Murray offered her services first to the British War Office and then to the French Red Cross, and with other medical women she organised a women's unit for service in France. During the first six months of the war she helped to collect funds for and commanded two voluntary hospitals, each of 100 beds, first at the Hotel Claridge in Paris and then at Wimereux, near Boulogne. In 1915 Sir Alfred Keogh, Director-General of Medical Services, offered her the command of a larger military hospital in London and, from this time, the Women's Hospital Corps served under the British War Office. St. Giles's Workhouse, Bloomsbury, was placed at her disposal and, with the rank of lieut.-colonel, Dr. Murray became doctor in charge of the Military Hospital, Endell-street, with 600–700 beds, in addition to two auxiliary hospitals in the vicinity of London. The story of this admirable work is told with modesty and humour by Dr. Murray herself in "Women as Army Surgeons" (Hodder and Stoughton).

Her friend and colleague, Dr. Louisa Garrett Anderson, writes: "Dr. Flora Murray shared the pride and the humility, the traditions, and the love of country which are the inheritance of an old family. She was singularly fitted for the rôle of wise physician. Reticent and tactful, with wide sympathy and good judgment, grace of mind and body combined to give her a place in many hearts and her practice grew. She believed in youth and she gathered round her at Endell-street a company of young women and girls who justified her pride by their beauty and ability, and the fidelity with which they discharged the tasks she committed to their care. She had the power to lead women and to call out in others courage and self sacrifice equal to her own.

From a portrait by Mr. Francis Dodd.

DR. FLORA MURRAY.

"No account of Dr. Flora Murray would be complete without reference to the part she took in the struggle for the emancipation of women. Inevitably, she was a suffragist and, as inevitably, when she deemed militancy necessary, a militant suffragist. She was an admirable committee member, a good public speaker, and a keen politician. Her sympathies were strong and tender—for animals, for children, for working women, indeed for all women in their aspiration for freedom and opportunity; and the 32,000 men who passed through her hands during the war received their share of consideration and comradeship."

Dr. Flora Murray died in her fifty-fourth year. The funeral took place at Penn Church on August 1st, when a personal address was given by the Rev. William R. Rice, of the West London Mission, who during the war had acted as Wesleyan chaplain to the Endell-street Hospital. Sir William Leishman, D.G.M.S., represented the War Office, and the large gathering of friends included representatives from the oyal Free Hospital, the Elizabeth Garrett Anderson ospital, the London School of Medicine for Women, he London Association of Registered Medical omen, the Women's Freedom League, and the West slington Infant Welfare Centre. A number of he women who had worked under Dr. Murray as rderlies and nurses also were present.

WALTER WILLIAM CHAMBERLAIN, M.D., C.M. EDIN.,

MEDICAL OFFICER OF HEALTH, RAWDON URBAN DISTRICT, YORKS.

Dr. W. W. Chamberlain died suddenly at his resience in Rawdon on July 28th. On the previous night e went to bed in his usual health, but towards orning he had a heart seizure and died suddenly fterwards. Dr. Chamberlain was a graduate of the niversity of Edinburgh and in his younger days was noted athlete, being also at one time tennis champion f the South of Scotland. Graduating M.B. in 1887, e was subsequently house surgeon at the Royal nfirmary, Birmingham, and senior house surgeon at he Halifax Infirmary. Twenty-seven years ago he ettled at Rawdon, where his abilities secured for him n extensive practice, and where for many years he as medical officer of health for the township. His fforts were intimately associated with the interests f the Rawdon Convalescent Home and the Mitchell emorial Home. Some months ago overwork brought n a breakdown in health, from which he appeared to ake a quick recovery, but he died at the relatively arly age of 62. Dr. Chamberlain leaves a widow, two ons, and a daughter ; their loss will be widely shared y all who came into contact with his wisdom, indliness, and courtesy.

ANDREW STEWART, L.R.C.P. EDIN.,

CONSULTING SURGEON, BIRKENHEAD BOROUGH HOSPITAL.

BY the death of Dr. Andrew Stewart on July 30th, t the age of 69 years, Birkenhead has lost an able and opular medical practitioner. Dr. Stewart received is medical education at Liverpool University and at t. Bartholomew's Hospital, graduating in 1881. For en years or more before his death he had suffered om chronic myocarditis, but did not allow his isability to interfere with his work or pleasure. He ad long recognised that his death would be abrupt, nd spoke freely of it with great sang-froid ; the end ame very suddenly as he sat at his desk writing a tter ; he died as he lived, beloved and respected by ll who knew him. Dr. Stewart took a great interest n his professional work, was a diligent reader of the edical journals, a man of wide general culture, and ond of sport, particularly of boating and golf. He eaves a widow, son, and daughter to mourn their loss. is brother, Mr. Gershom Stewart, is a well-known ember of Parliament.

THE King has sanctioned the promotion from on. Associate to Knight of Grace of Surg. Lieut.-Colonel van Evans, T.D., in the Order of the Hospital of St. John f Jerusalem in England.

BLENDING BUTTER AND MARGARINE.—An important ase relating to the blending of butter and margarine was ecided at the Salford Police Court on August 1st. The efendants were the Ballochmyle Creamery Co., Ltd., of yrshire. The prosecutor proved that a sample of the lend bearing the label "Ayrshire margarine rolls blended ith pure butter," for which an inspector had paid 1*s.* a pound, ontained only 1 per cent. of butter, the prosecution contendg that notwithstanding the description, the article was othing but margarine and should have been sold as such. would appear that legally, while it is permissible to mix ith margarine butter not exceeding 10 per cent., the article ven in that case had to be sold as margarine. The general rice of margarine in Salford where the sample was bought as 6*d.* per pound, and on the specific date butter was *s.* 4*d.* per pound. The stipendiary magistrate said that per cent. of butter was not sufficient to make him think at it was fair to the purchaser, and imposed a fine of £20. eave to appeal was granted.

Correspondence.

"Audi alteram partem."

MEDICAL CHARITIES.

To the Editor of THE LANCET.

SIR,—The remarks of the treasurer of the British Medical Association at its annual meeting, reported in your last issue (p. 229), will, I hope, bring home to the medical profession the needs of the Royal Medical Benevolent Fund. Dr. G. E. Haslip's comments call for some reply, and especially for information as to the efforts that are being made by the committee of management to increase the income of the Fund. Dr. Haslip is (as he stated) a member of this committee and as such has a voice in the management. It is a matter of regret that owing to his many engagements and his recent illness he has not been able to attend as often as we could wish. The Medical Agency, of which Dr. Haslip is chairman, has contributed most handsomely to the Fund. These gifts have been acknowledged with gratitude not only by the committee of management and in the medical press, but by special letters from the treasurer.

The subscriptions collected through the medium of the Association amounted last year to £800. Moreover, through the kindness of the Editor of *The Lancet* and the Editor of the *British Medical Journal*, a summary of grants made is published monthly. Those who read their journals cannot but be informed of the existence and the needs of the Fund. The conference to which Dr. Haslip refers took place in 1922 at the request of the officials of the British Medical Association and was attended by representatives of Epsom College and of the Royal Medical Benevolent Fund. Dr. Haslip proposed that the two bodies should be amalgamated and that there should be a central bureau for the collection of subscriptions.

This proposal did not meet with the approval of either body as it involved the abandonment of organisations, metropolitan and provincial, for the collection of funds that had been built up by years of patient endeavour, without any sufficient assurance of their adequate replacement—and in the case of Epsom College there was the additional objection that such action would tend to restore to the College as a whole, which is a general public school of the ordinary type, a charitable aspect, that had been proven to be harmful to the College, as well as to the medical foundation incorporate in it, and which some 30 years ago was an important factor in inducing the council of Epsom College to obtain an amending Act of Parliament. It was felt also that the aims of Epsom College and the Royal Medical Benevolent Fund were essentially distinct, in that the former existed primarily for educational, the latter exclusively for charitable purposes. Seeing that so far as the Fund was concerned some 20,000 members of the profession do not belong to the British Medical Association it was considered wiser to remain free to appeal from one centre to the profession as a whole. This proposal would, moreover, entirely disorganise the present system of collecting subscriptions through local secretaries which adds a personal and sympathetic touch of no little value.

Dr. Haslip's effort in the cause of education and of charity was cordially appreciated by both bodies, and I hope will not be lost upon the profession. That the executive have not been idle in developing new ideas and methods during the last few years, the following brief account will indicate and will go some way, I hope, to remove the impression of apathy conveyed in Dr. Haslip's remarks. It is an error into which he could not have fallen had he been in closer touch with the management. During the last two years special appeals have been issued in the following towns : Bath, Birmingham, Bolton, Bristol, Bromley, Birkenhead, Bury, Cambridge, Cornwall, S. Wales and Mon., Surrey, Devonshire, Bootle, Manchester, Portsmouth, Buxton, Burnley, Weybridge, Watford, Sutton, Enfield, Blackburn, Altrincham, and similar appeals are being prepared for other towns this autumn.

Realising that printed matter is often thrown in the waste-paper basket unread, the various local secretaries have been asked to write out an appeal which has been reproduced, a stamped envelope is addressed to every non-subscriber, and sent to the local secretary who completes the letter by inserting the name. The reply is returned to the office or the local secretary as the latter desires. In some cases an addressed stamped envelope is enclosed for reply. Up to the time of writing over £400 in new subscriptions, largely in bankers' orders, have been received this year and replies are still coming in. Not only have these undertakings been initiated by the hon. secretary, Dr. Newton Pitt, but owing to the illness of the secretary the bulk of the work has fallen upon him. The festival dinner in 1913, at which £3197 was raised, at least informed the profession, the entire body being circularised of the existence and needs of the Fund. Taking the last two decennial periods, the income from investments and subscriptions amounted in 1902 to £3946, in 1912 to £6222, and in 1922 to £8080, the amounts distributed being respectively £3795, £5497, £8397. The number of grantees has increased from 140 in 1902 to 304 in 1922, and annuitants from 140 to 168.

The progress of the Guild, a branch of the Fund, is shown by the increase in income from £1725 in 1912 to £2536 in 1922. The progressive character and successful results of the Guild's work are well known. Notwithstanding all that is being done the income is far below what is needed, and it must, I fear, be recognised that the lack of support is due to the apathy of the profession and not the slackness of the committee of management or of its executive.

I am, Sir, yours faithfully,
CHARTERS J. SYMONDS,
Hon. Treasurer.

Royal Medical Benevolent Fund, 11, Chandos-street, W. 1, August 6th, 1923.

PS.—Since the above was written I have seen the letter which appeared in THE LANCET last week from Dr. Astley V. Clarke, explaining the method adopted by the practitioners on the panel in Leicester of subscribing to the Fund a farthing for each State-insured person. Last year this yielded £50. I hope, with Dr. Astley Clarke, that other insurance areas will follow the example of Leicester.

THE IMPERIAL CANCER RESEARCH CAMPAIGN AND THE CANCER PROBLEM.

To the Editor of THE LANCET.

SIR,—The labours of the Medical Research Council and of the administrators of the Imperial Cancer Research Fund have been distinctly disappointing, and I fear unless the promoters of the British Imperial Cancer Research Campaign exercise their functions as to the use of the moneys they secure very wisely and very well the knowledge gained may be equally disheartening and disappointing.

Before going to the public for the large sum of money they require to put cancer research on a hopeful basis, it would be well to ensure that the administrative side of the scheme should be worked out not by a committee of scientists and medical experts alone, but that men of proved administrative and business capacity should be added to it, and that when the scheme is decided upon its operation should be in the hands of such a hybrid committee, and that it should have such powers of control conferred upon it as would ensure efficient coördination and coöperation, the avoidance of overlapping, and the strictest economy in the carrying out of research in all its varied departments. This committee should have power to afford pecuniary aid and special facilities for using the resources of any or all institutions subsidised from their funds to individuals who in their opinion displayed unusual ability, originality, and initiative in research. The subsidy granted by the Treasury to the Imperial Cancer Research Fund is utterly inadequate, and during the debate on the Ministry of Health vote on June 28th, in response to my appeal, the Ministry admitted this, but unless the public shows decidedly that it is behind the Minister in this connexion I fear the Treasury will not find the necessary funds. In virtue of any subsidy granted by the House of Commons, the Minister of Health, officials of his department, and Members of the House should be represented on the committee.

In my view, however, the Minister can assist research in other ways than by subsidy, and that, too, to an extent and with an efficiency which he alone can bring to bear. I refer to the clinical side of research. He alone can procure and collate that mass of clinical information possessed by the medical practitioners throughout the country. Through his medical officers of health and their staffs, and the Registrar-General's department, every case of death from cancer notified might be investigated not by a lay official, but by the M.O.H. himself or his tuberculosis officer, and a questionnaire drawn up that might include all matters bearing upon possible cancer causation. Cancer areas, and there are such, might be mapped out. Cancer houses, and it is suspected there are such, might be located. Information might be gleaned from meteorological, geological, water, and food-supply experts, *et hoc genus omne.* No possible avenue of approach to cancer should be left unexplored, and this could best be done through the health departments of the various local authorities under the guidance of the Minister. We are so utterly ignorant of the causes and sources of cancer that we never know at what moment or from what direction illuminating knowledge may arrive.

I am, Sir, yours faithfully,
Blackpool, August 1st, 1923. LEONARD MOLLOY.

CANCER FACTS AND THEORIES.

To the Editor of THE LANCET.

SIR,—May I be allowed to add a few remarks, from a different point of view, to your admirable leading article with this title in your issue of July 28th.

The complete change in the whole aspect of cancer research as a result of the discovery of means by which primary cancer can be produced in laboratory animals hardly seems to be realised. Before this discovery was made an incalculable number of experiments were done with transmissible tumours derived from primary cancers. Upon this work a vast superstructure of theory was built and acres of paper wasted. In my own case I wasted several years working with these tumours produced by grafting, to find in the end that they had not the characteristics of primary cancer, that what would cure them with practical certainty had no effect on primary cancer, and that in fact the two were in no way comparable. There was at that time no practicable method of bringing primary cancer under experimental conditions either for observation or for the trial of treatments. Cases occurring in the human subject obviously cannot be brought under experimental conditions. Spontaneous cancer occurring in animals is equally unworkable. Only large numbers of superficial cancers observed at a sufficiently early stage and occurring more or less simultaneously would provide the necessary material. When these points are considered it will be realised that those engaged in cancer research laboured under a serious, if not hopeless handicap. This handicap is now removed as far as laboratory work is concerned. Primary cancer can be produced at will and observed under experimental conditions with the full advantage of controls and every other necessary check. All excuse for premature experiments with probable or improbable cures upon the human subject is removed.

In these circumstances I think it is desirable that full credit should be given to those who made this covery, Yamagiwa and Schikawa of the University Tokyo. An account of the experiments by which y produced cancer in animals by the application coal tar, externally and by injection, is available the *Journal of Cancer Research*, January, 1918. ch and Driefuss were conducting researches on the ect of coal tar in the production of cancer in 1912 resumed the work in 1920. In mice they produced cer with the whole tar and also with some of its ferent elements. They claim to have isolated the cer-producing constituent of the tar.[1] They had n, however, forestalled by the Japanese. If it true as you say in your leading article that probably hin the next few years we may see "results in the gnosis and treatment of malignant disease which ld not have been foreshadowed a very few years " and these results are achieved along the lines suggest, then I think it should be clearly understood that the discovery that made this advance sible was the experimental production of primary cer in laboratory animals.

I am, Sir, yours faithfully,

CHARLES WALKER.

niversity of Liverpool, July 30th, 1923.

OPHTHALMOLOGICAL TRAINING FOR MEDICAL STUDENTS.

To the Editor of THE LANCET.

IR.—A not inappropriate comment on Mr. Percy mming's letter in THE LANCET of last week, relative the use of the ophthalmoscope in general practice, y be found in a sentence written more than 50 years by the distinguished physician who is now the gius Professor of Physic in the University of nbridge. The sentence runs: "Every medical ool is now . . . . bound to teach its students the of the ophthalmoscope as carefully as the use of the hoscope is taught." The task which Sir Clifford outt accepted in 1871 Mr. Flemming in 1923 proes to abandon. This is the more astonishing seeing the difficulties of the earlier date have been largely uced by the introduction of the electric ophthalmoe, and yet I should be inclined to accept Mr. nming's conclusion if, as he appears to decide, ruction and practice in the use of the ophthalmoe must be limited to the brief period spent by the lent in the ophthalmic department. If, however, exhortation conveyed in Sir Clifford Allbutt's parison is accepted, no such limitation can be wed. For the use of the stethoscope is taught by pelling the student to practise the instrument on y patient, as in this way alone can he acquire the itory standard which enables him to recognise both limits of the normal and departures, slight or gross, the accepted level. And when in the medical ds and out-patient service the ophthalmoscope is ht and practised as the stethoscope is taught practised—and the enterprise is easily accomed—the student will become as expert with the instrument as with the other. With neither can e expected to appreciate, without a long experi, the finer shades of change produced by disease. in each instance he is provided with an opportunity the self-education which is the avenue to expert ment, and if the medical curriculum affords and rces this opportunity it has largely fulfilled its . To abandon the ophthalmoscope as beyond scope of general practice because all its values not be obtained in some few weeks passed in an halmic department would be as reasonable as to don the stethoscope because, even at the end of curriculum, not all its possibilities have been ired. Let the fashion of instruction in the one be equally applied to the other, and there can be oubt that with each there will be one and the same dard of success.

I am, Sir, yours faithfully,

ndon, W., August 6th, 1923. C. O. HAWTHORNE.

PHYSICAL AND RECREATIONAL TRAINING.

To the Editor of THE LANCET.

SIR,—As one of those who were privileged to be present at the demonstration of physical and recreational training held before the B.M.A. at their recent meeting in Portsmouth, an account of which was given in your issue of last week, may I express the hope that the benefit of this kind of training shall not remain confined to the Navy. I suppose we most of us feel that our board school education fails to develop certain sentiments and elements of strong character which the Naval School of Physical and Recreational Training has managed to include.

It is to be hoped, therefore, that the principles involved will not be lost to sight by the educational authorities of this country, but that steps will be taken with the object of founding a national school of physical and recreational training, so that there may be gradually accumulated an ample supply of skilled instructors. For while there is an unquestionable need for this particular kind of training among the masses, it can be satisfactorily carried out only by teachers who have themselves undergone a thorough course of practical instruction in the principles upon which the system is based.

I am, Sir, yours faithfully,

Southsea, August 2nd, 1923. HAROLD BURROWS.

AN EPIDEMIC OF ERYTHEMA NODOSUM.

To the Editor of THE LANCET.

SIR,—With reference to the annotation on this subject in THE LANCET of July 28th (p. 180), giving details of Prof. E. Ledoux's paper in the *Revue de Médecine*, may I call the attention of your readers to an instructive monograph on erythema nodosum by Dr. A. A. Lendon of Adelaide? It is a little unfortunate, perhaps, that the author gave it the title of "Nodal Fever" (1905). For that reason it may have been overlooked by those interested in the subject. Dr. Lendon came to the conclusion as a result of special observation that the condition was *sui generis*, and, from what I have observed, I am inclined to agree with Dr. Lendon.

I am, Sir, yours faithfully,

London, W., August 3rd, 1923. GEORGE PERNET.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg.-Comdr. M. P. Jones is placed on the Retd. List with the rank of Surg.-Capt.

ROYAL NAVAL VOLUNTEER RESERVE.

The Royal Naval Volunteer Reserve Officers' Decoration has been conferred upon Surg.-Capt. A. R. Brailey.

The undermentioned appointments are made at the War Office: Lt.-Gen. Sir W. B. Leishman, F.R.S. (late R.A.M.C.), to be Director-General vice Lt.-Gen. Sir T. H. J. C. Goodwin (late R.A.M.C.), who is placed on retired pay.

ROYAL ARMY MEDICAL CORPS.

Maj. W. Davis to be Lt.-Col., vice Lt.-Col. G. H. Goddard (ret. pay).

Temp. Capt. T. Brodie relinquishes his commn. and retains the rank of Capt.

TERRITORIAL ARMY.

Capt. T. S. Goodwin (late R.A.M.C.) to be Capt.

D. R. Lewis and T. D. Overend to be Lts.

General Hospitals: The undermentioned relinquish their commns. and retain their rank except where otherwise stated: Capts. G. M. Benton (granted the rank of Maj.), J. P. Buckley, E. Moir (granted the rank of Maj.), T. P. McMurray, and H. H. Rayner.

ROYAL AIR FORCE.

Squadron Leader F. C. Jobson is transferred to Reserve, Class D.2.

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[1] Schweizerische Med. Woch., Basle, 1921. No. 45, 51.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

Adjournment of Parliament.

Parliament adjourned on Thursday, August 2nd, for the summer recess. It will reassemble on Nov. 13th.

HOUSE OF LORDS.

Wednesday, August 1st.

Dentists Bill.

The Dentists Bill was read a third time and passed.

HOUSE OF COMMONS.

Wednesday, August 1st.

Public Health.

On the motion for the third reading of the Consolidated Fund Bill,

Mr. Rhys Davies asked the Minister of Health whether he had any further information relative to the shortage of hospital accommodation in this country. While there were 30,000 empty beds in the Poor-law hospitals there were not many short of 100,000 people waiting for admission to the ordinary hospitals. In one London hospital there were 300 persons on the waiting list for 15 beds. He did not blame the Minister for this state of things, but he thought it was his duty to carry out the recommendations of the 1921 committee of inquiry. He wished to protest against the action of certain employers in Gloucester who had given notice of dismissal to their employees who refused to be vaccinated. He hoped that the Minister would come to the rescue of these people who objected to vaccination, because some people thought that the whole thing which had been boosted in the press as a small-pox scare was merely a "stunt" on behalf of some newspapers. The Minister of Health had received a deputation that week from the Lancashire Insurance Committee supported by Members of the House relative to an arrangement which it was suggested should be made between Mr. Spahlinger and the Ministry of Health. He was sorry to learn that the result of the negotiations so far was not very encouraging. He thought that the Minister would agree that the treatment of consumption had reached a deadlock. Sanatorium treatment after all was merely a treatment to ward off the disease. The deputation asked the Minister to support Mr. Spahlinger by way of a grant or subsidy and not only by way of purchasing the serum. He believed that the Minister had gone so far as to say that he was prepared to set aside a separate institution with 40 or 50 patients upon whom experiments could be made with the new treatment, but Mr. Spahlinger was not able financially to accept an agreement of this kind. He appealed to the Minister to come to Mr. Spahlinger's aid.

Mr. March said that in his district there had been a big increase in tuberculosis since the war and they had had the sanction of the Ministry of Health to have two doctors to attend to the patients. But during the summer holidays they had only one doctor instead of two. The consequence was that the patients had to be neglected for two months. They were also informed that extra nourishment was not to be granted to these patients. They were also informed that they were not to spend so much money in milk at their maternity and child welfare centres. He hoped that the Minister would help those local authorities who desired to do all they could to keep the people healthy.

Lieut.-Colonel Hodge said that the Spahlinger cure had proved efficacious in 80 per cent. of the cases treated. Mr. Spahlinger, however, was in difficulties to the extent of about £100,000. But only £24,000 of that amount was pressing. But for the sum of £100,000 they could obtain his laboratory, the whole of his estate, his father's estate, which was at present in the hands of the bank on mortgage. Mr. Spahlinger was willing to hand them over on trust for ten years. He only asked further for a sum of money to allow him to continue his research. He had gone the length of saying that they might appoint a committee to record how the money was spent. For the sum of £100,000 and a subsidy of £10,000 a year for three years Mr. Spahlinger was prepared to give the Minister of Health 50 per cent. of his sera and his vaccine.

Lord Eustace Percy, Parliamentary Secretary to the Ministry of Health, said that on Jan. 1st the number of empty beds in the Poor-law infirmaries was just over 6000, or about 18 per cent. Considerable steps were being taken all over the country for the better organisation and utilisation of the space in the Poor-law infirmaries. As regarded the point about employers and vaccination in Gloucester, if he were in that town he should certainly claim the right to protect his household from risk by refusing to take int his private employment any person who was not vaccinated and he should regard it as a gross form of tyranny if th State told him not to do so. There was a grant at any rat in certain cases and areas for extra nourishment for peopl suffering from tuberculosis. In regard to Mr. Spahlinge the Ministry of Health sent out a specially qualified office to Switzerland in 1922, and on receipt of that officer's repor the Ministry, in August last year, made a proposal to M Spahlinger which he was unable to accept. Arrangement made between the Red Cross Society and Mr. Spahlinge also fell through. This year there had been a renewal c the negotiations and the Minister had seen Mr. Spahlinge The position was this. The Government were intereste in the Spahlinger treatment and they were satisfied tha there was a prima facie case for such further scientifi inquiry as would enable medical authorities and the worl in general to form a definite and final opinion as to it efficiency. But if there was to be any question of th expenditure of public funds Parliamentary sanction woul be necessary, and the Government would not be justified i asking for such sanction except on the basis of adequat information and reasonable security. In the opinion of th Minister of Health these conditions could best be satisfie by asking Mr. Spahlinger to take an early opportunity making a full statement of his process and results to a bod competent to pass expert opinion upon it. His right hon friend understood that such an opportunity was bein afforded in this country, and when Mr. Spahlinger had take advantage of it it should be possible to arrive at a decisio as to what action, if any, could appropriately be taken b the Government. Meanwhile the Minister hoped that th appeal which was now being made for funds from privat sources might be successful in meeting the immediat difficulties of Mr. Spahlinger's position.

The Bill was read a third time.

Cost of Inmates of Poor-law Institutions.

Mr. Cecil Wilson asked the Minister of Health th annual cost per head for England and Wales of the inmates Poor-law institutions, distinguishing between children homes, infirmary, and other inmates respectively.—M Neville Chamberlain replied : The annual cost per hea for the year ending March 31st, 1921, for England and Wal of the inmates of the several classes of Poor-law institution was as follows :—

	£	s.	d
Homes for children	73	18	7
Poor-law infirmaries and other Poor-law institutions for persons suffering from infirmity of body or mind	148	12	1
General Poor-law institutions	78	14	7
All classes of Poor-law institutions	88	5	3

Venereal Disease Disinfectants.

Mr. Peto asked the Minister of Health whether he ha consulted the Law Officers of the Crown as to the effect the Venereal Disease Act, 1917, in connexion with the repo of the committee of inquiry on venereal disease under th chairmanship of Lord Trevethin ; and, if so, whether could give the House their opinion as to the position chemists under the Act and the necessity for legislation, effect was to be given to the recommendations in Clause 1 of the committee's report.—Mr. Neville Chamberlai replied : I have consulted the Law Officers of the Crown to the effect of Subsection 2 of Section 2 of the Venere Disease Act, 1917, and I am advised by them that there nothing in that subsection to prevent a chemist from sellin disinfectants for the prevention of venereal disease whe no written or printed instructions are affixed to or delivere with the disinfectant, or from giving verbal recommenda tions of medicinal preparations intended to be used or applie for the purpose. In the light of this opinion it woul appear that legislation would be necessary in order permit written or printed instructions to be supplied wit the disinfectant or to restrict the existing powers of chemis by confining them to the sale of articles, the composition which had been approved by a competent authority.

Deaths from Measles.

Sir Robert Newman asked the Minister of Health if th deaths resulting from measles had increased since th compulsory notification of that complaint had been abolishe —Mr. Neville Chamberlain replied : There has been n such increase. The average number of deaths from measl during the past three years has been 5042 per annum compared with 7318 per annum for the four years, 1916 t 1919, during which the notification of measles was compulso throughout the country.

Advertisements on Medical Certificates.

Mr. Raine asked the Minister of Health if he was awa that there were large stocks of certificates with advertis ments on the reverse side in the hands of some of the industri nsurance companies ; and would he, in view of the strong xception taken by the medical profession to such certificates eing issued, cause these stocks to be replaced by the new ertificates which were now being printed.—Mr. NEVILLE HAMBERLAIN replied : The hon. Member has been misnformed. Certificate books are issued to insurance committees and not to approved societies. A new supply ithout advertisements will be available shortly, but I annot undertake to withdraw the books already issued to ractitioners.

Vaccination and Small-pox.

Mr. LEACH asked the Minister of Health whether he had ny official information that it was the practice in the Jnited States to carry out vaccination by means of a single nsertion only, and had it been found that this method was s protective against small-pox as the official four marks nethod adopted in this country.—Mr. NEVILLE CHAMBERLAIN eplied : I have no official information as to the method of accination in the United States of America. The Royal ommission on Vaccination concluded that vaccination in our places giving a total vaccination area of half of a quare inch is more effectual and gives better protection gainst small-pox than is afforded by one place or a less accinated area.

Mr. PALING asked the Minister of Health whether, on ept. 1st, the form of statutory declaration of objection to accination contained in the notice of the requirements of he Vaccination Acts given by the registrar when a birth as registered was to be dropped ; and whether, under new order to be issued on the above date, every parent ishing to get exemption for his child was to be compelled o go to the vaccination officer for the form.—Mr. NEVILLE HAMBERLAIN replied : The answer to the first part of the uestion is in the affirmative and to the second in the negative. he effect of the new order, which has already been issued, that from and after Sept. 1st any parent wishing to make statutory declaration of conscientious objection to vaccinaion may obtain a form of declaration from the vaccination fficer, or may make a declaration in the form prescribed y the Vaccination Act, 1907, or in a form to the like effect.

Mr. BROAD asked the Minister of Health how many eaths from small-pox were registered from 1906 to 1920 ; ow many chicken-pox deaths were registered in the same eriod ; and whether in view of the statement of the egistrar-General in his report for the year 1889 that it was robable that most of the deaths registered as due to chickenox were in reality cases of modified small-pox, he would ave the vaccinal condition of the deaths from chicken-pox tated on the death certificate, and also have such cases ncluded in those of small-pox.—Mr. NEVILLE CHAMBERLAIN eplied : The particulars asked for are as follows :—

England and Wales.

ear.	Deaths from—		Year.	Deaths from—	
	Small-pox.	Chicken-pox.		Small-pox.	Chicken-pox.
906	21	106	1914	4	122
7	10	120	15	13	92
8	12	93	16	18	65
9	21	94	17	3	69
10	19	97	18	2	54
11	23	80	19	28	55
12	9	76	20	30	71
13	10	83			

The suggestions in the last part of the question will eceive consideration.

Asylum Superintendent's Appointment.

Major MCKENZIE WOOD asked the Minister of Health hether he had received any protest from the medical rofession in Lancashire with regard to the appointment of he superintendent of Prestwich Asylum, Manchester ; and hat action he proposed to take in the matter.—Mr. EVILLE CHAMBERLAIN replied : The Board of Control have eceived no official information of the appointment of a nedical superintendent at Prestwich Mental Hospital, ut they understand that an appointment, to which strong xception is taken, was made last week by the Lancashire sylums Board. The appointment rests with that body lone, but the Board of Control in January last suggested hat it would be of advantage if they were consulted in egard to it. I do not know why this advice has not been cted upon, but the Board of Control propose to make some nquiry about the appointment.

Maternity and Child Welfare Centres.

Mr. TURNER asked the Minister of Health if his department were taking any special steps to develop maternity nd child welfare clinics so as to cope with and help to reduce he death roll of ten per day occurring amongst women uring pregnancy and childbirth.—Mr. NEVILLE CHAMBERLAIN replied : I am well aware of the continued high rate of maternal mortality associated with childbirth, and under the Maternity and Child Welfare Act I am endeavouring to encourage the establishment and development of maternity and midwifery services (including antenatal centres, maternity hospitals, and the provision of midwives). I hope that by such means the present death-rate will be progressively and substantially reduced.

Deaths of Women in Childbirth.

Mr. RHYS DAVIES asked the Minister of Health the percentage of deaths of women on confinement in this country for each of the last ten years and for periods of ten years prior ; and how those figures compared with records in other countries.—Mr. NEVILLE CHAMBERLAIN replied : Figures for England and Wales in regard to deaths of women assigned to pregnancy or childbirth for the last ten years and for decennia from 1861 to 1910 are given in the following table together with such figures as are available in regard to other countries :—

Deaths of Women Assigned to Pregnancy or Childbirth.

A = Deaths per million living. B = Deaths per 1000 births.

—	England and Wales.*		Holland.†		Italy.		Japan.		Switzerland.		Sweden.	
	A	B	A	B	A	B	A	B	A	B	A	B
1861–70	341	4·70	—	—	—	—	—	—	—	—	—	—
1871–80	350	4·72	—	—	—	—	—	—	—	—	—	—
1881–90	318	4·73	—	—	—	—	—	—	—	—	—	—
1891–1900	301	5·09	—	—	—	—	—	—	—	—	—	—
1901–10	206	4·01	—	—	—	—	—	—	—	—	—	—
1913	185	3·96	—	—	—	—	—	—	—	—	53	2·28
1914	192	4·17	—	—	75	2·41	—	—	—	—	58	2·60
1915	176	4·18	—	—	—	—	120	—	—	—	63	2·90
1916	166	4·12	134	2·58	59	2·45	—	—	64	3·37	56	2·66
1917	132	3·89	131	2·53	56	2·86	120	3·59	44	2·42	51	2·46
1918	127	3·79	147	3·00	—	—	—	—	49	2·62	—	—
1919	154	4·37	161	3·35	—	—	—	—	60	3·19	—	—
1920	210	4·33	—	—	—	—	—	—	62	2·93	—	—
1921	168	3·91	—	—	—	—	—	—	—	—	—	—
1922	149	3·81	—	—	—	—	—	—	—	—	—	—

* Prior to 1911 puerperal nephritis and albuminuria were not classed to pregnancy and childbirth and consequently the rates shown from 1913 onwards are from ·22 to ·25 in excess of what they would have been under the old classification.

† The number of deaths per million living in Holland for 1911–15 (inclusive) was 126. The number of deaths per million living in Denmark in 1920 was 60 and the number per 1000 births was 2·35.

Tuberculosis in the Navy.

Lieut.-Colonel MOORE-BRABAZON asked the First Lord of the Admiralty the number of men, categoried in branches, who had been discharged from the Navy with tuberculosis in the last three years.—Major BOYD CARPENTER replied : No statistics have been prepared for 1920, and the figures for 1922 are not yet available. The following table gives the figures for 1921 :—

Classes.	No. of cases.	Ratio per 1000 of average number borne.
Commissioned officers	10	1·77
Subordinate officers	—	—
Warrant officers	2	0·69
Seamen	103	2·46
Boys	14	1·69
Engine-room ratings	75	2·50
Marines	24	3·20
Stewards and cooks	5	1·33
Sick-berth staff	6	4·27
Regulating branch	—	—
Writers	8	8·77
Victualling ratings	3	4·49
Ships cooks	3	1·71
Armourers and blacksmiths	—	—
Other artisans	3	0·83
Kroomen, seedies, and lascars	—	—
Telegraphists	8	2·76
Miscellaneous ratings	—	—

Child's Death in Hospital.

Mr. GILBERT asked the Minister of Health whether his attention had been called to an inquest held on a child in one of the hospitals of the Metropolitan Asylums Board, at which charges were made by nurses against the doctor who attended the child ; whether he proposed to hold any inquiry into the case ; and could he make any statement on the subject.—Mr. NEVILLE CHAMBERLAIN replied : I have received a report upon this case from the Metropolitan Asylums Board, of which I will send the hon. Member a copy. It will be seen from the report that a full inquiry was held by the coroner, that the jury found that the death of the child was due to natural causes, and that the statements made by the nurses contained serious discrepancies. The nurses have been reprimanded for their failure to make an immediate report of the occurrences which they allege took place. Under all the circumstances I do not think that further inquiry on my part would serve any useful purpose.

Replying to a further question, Mr. Chamberlain said that he believed that the doctor had since resigned, but he could not state the reason for the resignation.

Thursday, August 2nd.

Highbury Pension Hospital Fire.

Mr. Macpherson asked the Minister of Pensions whether the committee which was appointed by him to enquire into the cause of the fire at Highbury Pensions Hospital and to make recommendations for the prevention of fire in the future at Ministry hospitals had yet reported, and if so, whether the report would be published.—Major Tryon replied: I have just received the report of this committee and I am arranging for it to be published.

Grant for Combating Venereal Disease.

Mr. Albert Bennett asked the Prime Minister whether the Government would consider the allocation of the £12,000 annual grant for combating venereal disease between the Society for the Prevention of Venereal Disease and the National Council for Combating Venereal Disease; whether he was aware that the latter organisation was the only one in receipt of any State assistance; and why, seeing the Trevethin report had been unconditionally accepted by both, there was any differentiation made in respect to the Government assistance given.—Mr. Neville Chamberlain replied: As regards the first part of the question, the maximum grant which will be paid from the Ministry direct to voluntary organisations in aid of their work in combating these diseases is £7500. The answer to the second part is in the affirmative. As regards the third part, the question of Government assistance to the work of voluntary organisations will come up for review in connexion with the recommendations in the Trevethin Report which is now under consideration.

Oxford and Cambridge Grants.

Mr. Charles Buxton asked the Secretary to the Treasury whether he would take steps to obtain and publish annual returns from Oxford and Cambridge Universities in the same form as those now published in respect of other universities in Great Britain under the auspices of the University Grants Committee.—Sir W. Joynson-Hicks replied: I have requested the University Grants Committee to take such steps as appear practicable to obtain from the university authorities at Oxford and Cambridge returns which will be as nearly comparable as circumstances permit with those annually supplied to the Committee by other grant-aided university institutions and published in the Committee's Blue Book. The hon. Member will, however, appreciate that the conditions at Oxford and Cambridge differ in certain material respects from those which prevail at the other universities, and that as the records and accounts at the two ancient universities have not hitherto been kept with a view to returns on the lines which are required by the University Grants Committee, a little time may elapse before properly comparable figures for Oxford and Cambridge can be provided.

Medical News.

University of Edinburgh.—At the graduation Ceremonial on July 20th the following degrees were conferred:—

Doctor of Medicine.

Alfred F. Adamson, Robert A. Chambers (in absentia), Jacob D. M. Claassens, *James H. Clarke, William H. Dickinson, James F. Duncan, *Basil A. G. A. Edelston, †Joseph H. Fairweather, Thomas J. Howell, †Hugh A. Macmillan, ‡Robert Mailer (in absentia), †Gerald I. Moriarty, *James P. Watt, and ‡Harold W. Wilson.

* Commended for thesis. † Highly commended for thesis.
‡ Awarded gold medal for thesis.

Bachelor of Medicine and Bachelor of Surgery.

James N. Adam, Stuart F. Allison, David G. Anderson, David T. Anderson, Edward W. Anderson, Hope P. Anderson, David Band, John S. Banks, Charles Bateman, Elizabeth A. Baxendine, Ralph S. Begbie, Malcolm J. Bett, Alexander Beveridge, Helen Blacklay, Anna L. Blair, Charles E. M. Blumer, Harriette G. Bogle, Jane P. S. Bow, George P. F. Bowers, Margaret G. Bowie, Edwin F. Boyd, William Boyd, Robert D. Bradshaw, Donald Brims, Norman M'Dowell Brown, William N. Brown, William J. Burns, Thomas D. Burt, Andrew J. M. Butter, Eva T. Cairns, Flora H. M. Calder, Dugald Cameron, James D. S. Cameron, Angus Campbell, Lovat F. Capell, †Robert Carmichael, Harold Carter, William H. Carter, Aileen M. Chester, Dorothy A. Christie, Alec L. Clark, Antonio G. Coia, Harry H. Condie, John Cooper, Andrew Cowan, John M. Cowan, Marget A. Craig, James Crooks, James F. Cunningham, James D. Dear, Robert Dick, Alexander Dickson, William R. Duff, Gavin A. Dunlop, Henry H. Dunlop, Charles W. Durward, *Caroline A. Elliott, Helen B. Ewart, Marjory H. Ewing, William R. D. Fairbairn, John S. Faulds, Alan W. Fawcett, Andrew W. Gardiner, Elizabeth M. R. Garrigan, Frederick W. Gavin, John Gillies, Malcolm A. Graham-Yooll, Robert Grant, *John Gray, Alexander M. M. Grierson, David Grieve, Ian M. D. Grieve, Basil T. Halliwell, Ronald W. W. Hardie, George M'Neill Hargreaves, Clement Henri de la Harpe, James A. Harris, Edith N. Hartley, William M. Hetherington, Stephen L. Hislop, Paget C. C. B. Hook, Doris M. Hopps, George Horne, Agnes M. M. Hunter, Edith I. M. Irvine-Jones, Agnes L. Jenkins, Clifford D. Kennedy, Alexander M. Kerr, Henry J. R. Kirkpatrick, Pieter Louis Kock, Ena M'Laren Laing, John Lambert, William T. Lawson, Tiang Keng Lee, Reuben Levinson, Nora Lister, Elspeth H. R. Livingstone, William Love, Edward B. Low, Phyllis M. H. Lunn, George A. Macadie, Donald I. Macaulay, Archibald R. MacCallum, Alexander R. M'Clure, Adam D. Macdonald, John A. Macdonald, Andrew M'Dowall, William S. M'Ewan, Robert M. Macfarlane, John S. MacGill, Isaac H. Maciver, Francis B. MacKenzie, Alexander MacPherson, John B. C. Madge, William F. Mair, Desmond S. Malone, Ahmed Mariy, John J. B. Martin, George A. Masson, Reginald J. Matthews, Margaret G. Maxwell, *Alison J. Maxwell-Wood, Henry Miller, Ellen A. Morrison, George H. Morrison, William Morrison, Janet M. Morton, Ralph Morton, Hugh Munro, Harold B. Newcombe, Agnes M. Ogilvie, Denis C. Osborne, Llewelyn C. Palmer-Jones, *James R. K. Paterson, Susanne J. Paterson (in absentia), Kate Y. Pearson, Archibald Penman, George H. Percival, Oswald O. Popper, Frederic N. R. Price, Jean R. Purves, Adam L. K. Rankin, John Reid, Robert J. Reid, James S. Riddle, Frank L. Rifkill, Richard P. A. Rigg, Hilda C. Roberts, Ian M. Robertson, Gilbert M. Ross, Alexander A. M. Sandison, Pincus Schneiderman, William C. S. B. Sewrey, Donald A. M. Shearer, Bertram Siddons, William A. Simpson, James Sinclair, Cecil Siung (in absentia), James M'Ildowie Smellie, Arthur B. Smith, Arthur F. Smith, Dorothy F. Smith, Jean L. Smith, Sydney M'Kendrick Smith, George Somerville, Robert C. Speirs, Alice Steven, Donald B. Strachan, *John Sturrock, Theodotus J. Sumner, Hector W. Sutherland, Charles J. Swanson, Richard E. M. Taunton, Leslie M. Thompson, Vera Thompson, Elsie Thomson, Frank B. Thomson, George H. Thomson, Kenmure J. Thomson, Mahmoud S. Toukhy, John Trotter, Thomas Tully, Anne M. Turnbull, Duncan A. Urquhart, Edward R. C. Walker, Forbes M'Donald Walker, Edgar P. Waters, William N. B. Watson, George M. Westwood, *Adam Cairns White, Illtyd G. Williams, John H. Williams, Norman B. Williamson, Charles R. Wilson, Jeanie Wilson, Mary Wilson, *William Muirhead Wilson, John F. S. Wiseman, Gerald K. Wood, Eric D. M. Wright, David H. D. Young, James B. Young, and James N. Young.

† First-class honours. * Second-class honours.

Diploma in Public Health.

Esther J. Campbell, Mary C. Campbell, Grace Cumming, Gladys H. Dodds, Thomas Ferguson, Elspeth L. Gilmour, Elizabeth R. Kemp, Catherine A. J. Mitchell, Dorothea M. Norwell, Annie C. Roberts, Jessie W. Strang, Isabella Taylor, Annie E. Webster, and Doris S. Williams.

The following awards were also made: Thesis Gold Medallists: Robert Mailer and Harold W. Wilson. Cameron Prize in Practical Therapeutics: John J. R. Macleod. Gunning Victoria Jubilee Prize in Materia Medica: John H. Crawford. Gunning Victoria Jubilee Prize in Forensic Medicine: Douglas J. A. Kerr. Gunning Victoria Jubilee Prize in Obstetrics: Douglas A. Miller. Ettles Scholarship and Leslie Gold Medal: Robert Carmichael. Allan Fellowship in Clinical Medicine and Clinical Surgery: John Gray. Murchison Memorial Scholarship in Clinical Medicine: John Gray. M'Cosh Graduate's and Medical Bursaries: William N. B. Watson. Beaney Prize in Anatomy and Surgery: Caroline A. Elliott. Mouat Scholarship in the Practice of Physic: James L. N. Dinwiddie. Conan Doyle Prize: Gabriel G. King. Annandale Gold Medal in Clinical Surgery: John M. Cowan. Buchanan Scholarship in Gynæcology: Ian M. Robertson. James Scott Scholarship in Midwifery: Frank B. Thomson. Scottish Association for Medical Education of Women Prize: Caroline A. Elliott. Dorothy Gilfillan Memorial Prize: Harriette G. Bogle. Wellcome Medals in the History of Medicine: Gold Medal, James Aitken; Silver Medal, Donald G. S. M'Lachlan. Wightman Prize in Clinical Medicine: William J. A. Coldstream. Cunningham Memorial Medal and Prize in Anatomy: George Brown. Whiteside Bruce Bursary: Ian G. W. Hill.

Prudential Assurance Company and Medical Research.—The board of management of the Hospital for Sick Children, Great Ormond-street, London, whose Chairman is the Earl of Wemyss, have decided to establish a Research Department in which highly trained experts may study the life histories, conditions of growth, &c., of living agents of children's diseases. Examination revealed the fact that some £2000 would be required each year for the working of the Research Department; the board appealed for financial help to the Directors of the Prudential Assurance Company, on the ground that the proposed research work would promote longevity and the development of a healthier and more virile race. As a result, the Directors of the "Prudential" consented to provide the money required for the first year.

London Hospital.—The old students' dinner of e London Hospital will be held at the Trocadero Restaurant Wednesday, Oct. 3rd, at 7.30 for 8 p.m.

The Schorstein Memorial Lecture in Clinical Medicine ill be delivered by Dr. Gordon Holmes in the Medical ollege of the London Hospital during the winter term.

London Hospital Medical College.—A lecture the Value of Accurate Small-pox Diagnosis will be livered in the Anatomical Theatre of the College by Dr. W. cConnel Wanklyn, principal assistant medical officer of alth, London County Council, on August 15th.

St. Thomas's Hospital Medical School.—ntrance Scholarships for the year 1923 have been awarded under: Entrance Arts Scholarship (value £50): Mr. . H. Le Good (Alleyn's School). Entrance Science Scholar-ips: (1) Mr. H. C. Trowell (Reigate Grammar School) alue £150; (2) Mr. I. J. Jones (St. Thomas's Medical chool) value £60. William Tite Scholarship (value £25): r. J. B. George.

Fellowship of Medicine and Post-Graduate edical Association.—A special course of post-graduate ctures in infants' diseases, for medical officers of welfare ntres and others, will be given at the Infants' Hospital, ncent-square, Westminster, London, S.W., from Sept. 3rd 21st. The fee for the course is £5 5s., and the names of ose wishing to attend should be sent at once to the Secre-ry of the Fellowship, 1, Wimpole-street, W. 1. The dates the lectures will be announced in our Medical Diary.

Walsall M.O.H.: A Compromise Reached.—me time ago the Walsall Town Council offered a salary of 00 per annum as the salary for the borough medical officer. he British Medical Association stipulated that the amount ould be £1100, and a dispute thereupon arose, with the sult that there was not a single application for the pointment. On August 4th a compromise was reached, d Dr. J. A. Clark, borough tuberculosis officer, was pointed at a salary of £900.

Dr. Michael J. Nolan, resident medical superin-ndent, Down District Asylum, Downpatrick, Co. Down, s been elected President of the Medico-Psychological ciety of Great Britain and Ireland. Dr. Nolan is probably e only man to hold office under both the Irish Free State d the Government of Northern Ireland, being consulting sitor in lunacy to the Lord Chief Justice of either country.

Royal Northern Hospital.—The hospital board management announce that the £20,000 which was needed July 31st to prevent the closing of wards in the four stitutions under their control has not been obtained. nsequently they have had no alternative but to close 70 ds. Although the appeal was widespread, only £1500 have en received towards this fund. This closing of 70 beds eans that over a period of a year another thousand cases ill have to be refused admission for treatment.

Donations and Bequests.—The late Mr. Hugh llerton, of Brackenhoe, Sale, Cheshire, has left £5000 to e Christie Hospital Cancer Pavilion (if not already given), r assisting in carrying on scientific investigation in relation cancer; £500 each to the Whitehaven and West Cumber-nd Infirmary and the Manchester Royal Infirmary; and 00 each to the National Lifeboat Institution, the Royal ye Hospital, the Northern Hospital for Women and ildren, Henshaw's Blind Asylum, the Deaf and Dumb stitution, the Royal Schools for the Deaf and Dumb, ncoats Hospital and Ardwick and Ancoats Dispensary, and e Hospital for Consumption, Hardman-street, Manchester.

London (R.F.H.) School of Medicine for omen.—The following scholarships have been awarded for e session 1923–1924: Fishmongers' Exhibition for Girls 50 a year for 3 years): Miss Winifred Harris (L.S.M.W.). stock Scholarship (£90 for 4 years): Miss Alice Hodge .S.M.W.). St. Dunstan's Medical Exhibition (£60 for or 5 years): Miss Joyce Woods (City of London Girls' hool). Mrs. George M. Smith Scholarship (£50 a year for years): Miss Kathleen Gambrell (Streatham Secondary hool). Dr. Margaret Todd Scholarship (£37 10s. for 4 years): iss Dorothy Wilkins, B.Sc. (Bedford College for Women). abel Sharman Crawford Scholarship (£20 for 4 years): iss Marguerite Fenn (L.S.M.W.). Sarah Holborn Scholar-ip (£20 for 5 years): Miss Ivy Varley (Newland High hool, Hull). Isabel Thorne Scholarship (£30): Miss ecima Tracey (Hamilton House, Tunbridge Wells). Dr. lith Poohey Phipson Post-Graduate Scholarship (£100 year for 1, 2, or 3 years): Dr. G. M. R. Webster.

Public Health Legislation in the Irish Free State.—On August 1st a deputation from the Irish Medical Committee waited on the Minister of Local Government (Mr. E. Blythe) to make certain representations to the Minister with regard to the Public Health Bill which, it is announced, will be brought forward in the Dail at an early date. The deputation urged the acceptance of the entire programme of the Irish Public Health Council, including the establishment of a Ministry of Health and of a National Medical Service, and discussed questions relating to the Poor-law Medical Service (inadequate salaries, arrangements for holidays, and fees for occasional services).

Medical Charitable Society for the West Riding of Yorkshire.—This society, founded in 1828, is one of the most flourishing of the societies connected with the medical profession. The annual subscription is one guinea, and those eligible for membership are medical men who at the period of their becoming members have not passed the age of 40, and have not been in practice in the West Riding more than 15 years without subscribing. From time to time the society has given in grants a sum amounting very nearly to £80,000; its investments have a nominal value of £43,374. The year from July 1st, 1922, to June 30th, 1923, began with a membership of 879. This number fell during the year to 853 in consequence of deaths and resignations, but was brought up to 897 by the election of new members, and the society now has a larger membership than ever before. Since the year 1911 the society has been administered under a trust deed. The work done by Dr. J. E. Eddison, who of late years has devoted much of his leisure to the work of the charity, is gratefully borne in mind by those connected with the society. No payment whatever is made to anyone connected with the work of the society, except to the professional auditors. Every request for assistance is closely scrutinised and sympathetically dealt with, and it is confidently claimed that no deserving case is ever passed over.

Appointments.

Marcus, Maurice, M.B., B.S. Lond., M.R.C.S., has been appointed Hon. Anæsthetist London Jewish Hospital.

Sandiland, E. L., M.B., B.S. Lond., D.P.H., M.R.C.S., L.R.C.P. Lond., Medical Superintendent of East Lancs Tuberculosis Colony, Cheshire.

Schuster, Norah, M.B., Ch.B., Pathologist to the Infants Hospital, Vincent-square, Westminster.

Manchester Royal Infirmary: **Stafford, H.**, M.B., Ch.B. Manch., Assistant Director of the Clinical Laboratory; **Smith, Eleanor P.**, M.B., Ch.B. Manch., Assistant Resident Medical Officer Central Branch.

St. Thomas's Hospital: **Dyson, A. D.**, M.R.C.S., L.R.C.P. Lond.; **Murrell, E. B.**, M.R.C.S., L.R.C.P. Lond.; **Cooper, G. K.**, M.B., B.Ch. Camb.; **Palmer, H. M.**, M.R.C.S., L.R.C.P. Lond.; **Lautre, M. A.**, M.R.C.S., L.R.C.P. Lond; **Lupton, C. A.**, M.R.C.S., L.R.C.P. Lond.; **Briggs, T. F.**, M.R.C.S., L.R.C.P. Lond.; **Williams, L. G.**, M.R.C.S., L.R.C.P. Lond., Casualty Officers and Resident Anæsthetists. **Story, A. G.**, M.R.C.S., L.R.C.P. Lond.; **Cole, L. B.**, M.B., B.Ch. Camb.; **Gibson, C. P. R.**, M.R.C.S., L.R.C.P. Lond.; **Fuller, C. B. S.**, M.B., B.Ch. Camb., Resident House Physicians. **Lund, G. S.**, M.R.C.S., L.R.C.P. Lond., Resident House Physician for Children. **Sudbury, F. B.**, M.R.C.S., L.R.C.P. Lond.; **Davies, D. A.**, M.R.C.S., L.R.C.P. Lond.; **Hughes, K. E. A.**, M.R.C.S., L.R.C.P. Lond.; **Crockford, A. L.**, M.B., B.Ch. Camb., Resident House Surgeons. **Wilkinson, M. C.**, M.R.C.S., L.R.C.P. Lond., Resident Orthopædic House Surgeon. **Kies, J. P.**, M.R.C.S., L.R.C.P. Lond.: **Walford, A. S. H.**, M.B., B.Ch. Camb., Resident House Surgeons for Ear, Nose, and Throat. **Berridge, W. C. M.**, M.R.C.S., L.R.C.P. Lond., Senior Obstetric House Physician; **Morrison, R. G.**, M.R.C.S., L.R.C.P. Lond., Junior Obstetric House Physician. **Doggart, J. H.**, M.R.C.S., L.R.C.P. Lond., Senior Ophthalmic House Surgeon; **Nicory, C.**, M.R.C.S., L.R.C.P. Lond., Junior Ophthalmic House Surgeon. A. F. **Potter**, M.R.C.S., L.R.C.P. Lond., R.M.O. St. Thomas's Home. **Hill, H. G.**, M.B. Camb., Senior Medical Casualty Officer. **Patrick, C. V.**, M.R.C.S., L.R.C.P. Lond., Senior Surgical Casualty Officer. **Cardell, J. D. M.**, M.B., B.S. Lond., Senior Resident Anæsthetist. **Cavenagh, J. B.**, M.B., B.Ch. Oxf.; **Neilson, D. F. A.**, F.R.C.S. Eng.; **Jones, B. H.**, M.R.C.S., L.R.C.P. Lond.; **Facey, R. V.**, M.R.C.S., L.R.C.P. Lond.; **Lockhart, L. P.**, M.R.C.S., L.R.C.P. Lond.; **Marriner, H. L.**, F.R.C.S. Edin.; **Hicks, E. W.**, L.M.S.S.A.; **Penman, G. G.**, M.R.C.S., L.R.C.P. Lond.; **Franklin, C. A. H.**, M.R.C.S., L.R.C.P. Lond.; **Creed, R. S.**, M.R.C.S., L.R.C.P. Lond.; **Curwen, E. C.**, M.R.C.S., L.R.C.P. Lond.; **Stevens, A. L. B.**, M.B., Ch.B. Oxf.; **Mowle, A. C.**, M.R.C.S., L.R.C.P. Lond.; **Walker, E. G. L.**, M.R.C.S., L.R.C.P. Lond.; **Allan, F. G.**, M.R.C.S., L.R.C.P. Lond.; **Jarratt, W. O. C.**, M.R.C.S., L.R.C.P. Lond.; **Alden, J. W.**, M.R.C.S., L.R.C.P. Lond.; A. L. P. **Jeffery**, M.R.C.S., L.R.C.P. Lond., Clinical Assistants.

Vacancies.

For further information refer to the advertisement columns.

Bath, Royal Mineral Water Hospital.—Res. M.O. £200.
Belgrave Hospital for Children, 1, Clapham-road, S.W.—H.P. and H.S. Each £100.
Birkenhead Borough Hospital.—Hon. Skin Specialist.
Birmingham, City Hospital, Little Bromwich.—Senior Asst. M.O. £350.
Birmingham General Dispensary.—Res. M.O. £450.
Birmingham, West Heath Sanatorium, &c.—Med. Supt. £650.
Blackburn County Borough.—Asst. M.O.H. £736.
Bristol, Cossham Memorial Hospital, Kingswood.—H.S. £120.
Cape Town University.—Wernher Beit Professor of Bacteriology.
Carlisle, Cumberland Infirmary.—Res. M.O. £175.
Central London Throat, Nose, and Ear Hospital, Gray's Inn-road, W.C.—Res. H.S. £75.
Chester City and County.—Asst. M.O.H. £500.
Croydon County Borough.—Deputy M.O.H. and School M.O. £780.
East African Medical Service.—M.O. £600.
Exminster, Devon Mental Hospital.—Third Asst. M.O. £300.
Federated Malay States, Central Mental Hospital.—Asst. Med. Supt. £616.
Hull Tuberculosis Sanatorium, Cottingham.—Res. Tub. O. £350.
Leeds University, Dept. of Physiology.—Prof. of Phys. Also Lecturer in Phys. £800 and £600 respectively.
Lenham Sanatorium.—Med. Supt. £650.
Liverpool, Royal Southern Hospital.—Two H.P.'s. and Three H.S.'s. Each £100. Also Res. Cas. O. £150.
London Temperance Hospital, Hampstead-road, N.W.—H.P. £120.
Manchester, Barnes Convalescent Hospital, Cheadle.—Res. M.O. £250.
Manchester, St. Mary's Hospitals for Women and Children.—Two H.S.'s. Each £50.
Rotherham Hospital.—Sen. H.S. £260.
Royal Naval Medical Service.—Surgeon Lieutenants.
Staffordshire Education Committee.—Two Asst. School Med. Inspectors. £600.
Sutton, Surrey, Downs Hospital for Children.—Asst. M.O. £515.
Warwickshire, King Edward VII. Memorial Sanatorium, Hertford Hill, near Warwick.—Asst. Res. M.O. £350.
West African Medical Service.—M.O. £660.
West Riding County Council.—School Med. Inspector. £500.

The Secretary of State for the Home Department gives notice of vacancies for Medical Referees under the Workmen's Compensation Act, 1906, for County Court Circuit Nos. 6, and 42 and 50 (St. Helens, &c., County Courts). Applications should reach the Private Secretary, Home Office, not later than August 25th.

Births, Marriages, and Deaths.

BIRTHS.

LIVINGSTON.—On August 2nd, at Wigmore-street, the wife of Flight-Lieut. P. C. Livingston, R.A.F. Medical Service, of a son (Clermont).

MARSHALL.—On August 3rd, at the Manor House, Goudhurst, Kent, the wife of R. Prynne Marshall, M.R.C.S., L.R.C.P., of a son.

PARKINSON.—On August 3rd, at 1, Devonshire-place, W. 1, the wife of John Parkinson, M.D., F.R.C.P., of a daughter.

MARRIAGES.

MARKLOVE—DAVIES.—On August 2nd, at the Parish Church, Stroud, John Carrington Marklove, M.R.C.S., L.R.C.P., to Muriel Alice Mary Davies, M.R.C.S., L.R.C.P., elder daughter of Mr. and Mrs. A. Barnes Davies, of The Old Vicarage, Stroud.

UNDERHILL—WORNUM.—On August 2nd, at All Souls' Church, Hampstead, Sydney William Frank Underhill, M.A., B.M., B.Ch., to Edith Betty, youngest daughter of the late G. Porter Wornum, Esq., L.R.C.P., M.R.C.S., and Mrs. Wornum, of Belsize-park, Hampstead.

DEATHS.

SMITH.—On August 5th, at 12, Clarence-road, Gorleston-on-Sea, Oliver Smith, M.B., Ch.B. Edin., aged 41 years.

STEWART.—On July 30th, suddenly, at his residence, Devonshire-road, Birkenhead, Andrew Stewart, L.R.C.P., L.R.C.S., in his 69th year.

WILKINSON.—On July 28th, at Portland-place, Leamington Spa, suddenly, Lancelot Craven Wilkinson, M.R.C.S., L.R.C.P., F.R.G.S., aged 43 years.

WILLIAMS.—On August 1st, at the County Hospital, Huntingdon, Frederick Edgar Williams, M.R.C.S., L.R.C.P., B.A. Camb., in his 61st year.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

THE LANCET: SUBSCRIPTION RATES.

INLAND	One Year	£2	2	0
	Six Months	1	1	0
	Three Months	0	10	6
ABROAD	One Year	2	10	0
	Six Months	1	5	0
	Three Months	0	12	6

Notes, Comments, and Abstracts.

SCHOLARSHIP IN MEDICINE.

BY SIR HENRY MORRIS, BART., M.A., M.B. LOND.

IN a letter to the *Times* on June 11th last, Mr. Gillbard alluded to the scientific, technical, and materialistic trend of medical education in the present day, and said that on that account a liberal and classical preliminary education for medical students is more than ever necessary. He told how Harvey, when in attendance on Charles the First at Edgehill, was found behind a hedge in the danger zone reading Virgil; and he grouped together Harvey, Sydenham, and Hunter as typical believers in the humanities. Two days later, Mr. George C. Peachey, in a letter also in the *Times*, (June 13th), took exception to the inclusion with Harvey of both Sydenham and "John" Hunter, as examples of the effect of classical education upon the progress of medical science—a selection which, he thinks, singularly unhappy.

In regard to Sydenham, who published a number of his works in the Latin language, there has been a considerable amount of discussion as to whether he wrote them originally in Latin or in English and got them translated into Latin. In regard to Hunter, Mr. Gillbard, in mentioning him, did not say "John" Hunter, who, it is true, had no classical education at all, and little general education of any kind. The Hunter to whom Mr. Gillbard referred, was, no doubt, John Hunter's brother, Dr. William Hunter, a man of great culture and learning, whose fine library of Greek and Latin classics, and whose extensive collections of natural history and other specimens passed to, and are now the property of, the University of Glasgow.

Francis Adams, M.R.C.S. Eng.

But the chief interest of Mr. Peachey's letter lies in his revival of the memory of a certain country surgeon, who lived and died a general practitioner in a small village on Deeside, and whose name is now almost forgotten, though it is but 62 years since his death. The name is that of Dr. Francis Adams, M.R.C.S. Eng., M.A. Aberdeen, and LL.D. Glasgow, of Banchory-Ternan, the editor and translator of Hippocrates, Paulus Ægineta, and Aretæus. Mr. Peachey spoke of Dr. Adams as "probably the greatest classical scholar among British medical practitioners of all time," and quoted some anonymous person who, in 1857, described him as "the most learned physician in Britain and probably in Europe."

Beyond question Dr. Adams was a great scholar, who possessed a most accurate and extensive acquaintance with the language and literature of Greece, and he ought to be remembered with special pride, and for all time, by those who practise medicine, as one whose classical attainments and competent knowledge of the French and German languages caused him to stand out prominently during life as a scholar, and enabled him to leave behind him writings which should make his name for ever famous. His translation of the "genuine" Hippocratic treatises is the only complete one in the English language; the same is true of his translation of the seven books of Paulus Ægineta, and of the treatise of diseases by Aretæus, the Cappadocian, one of the most celebrated of the ancient Greek physicians, and who is noticeable because of his dissension from the teaching of Hippocrates when he thought it imperfect or incorrect. By these translations, Adams did as great a service to those members of the medical profession who are not great Greek scholars, as Jacques Amyot (1513–93) did for the general run of French readers by his numerous translations of Greek literature and, especially, by his translation of Plutarch's "Lives" from the Greek into French; and as an English translation of the "Lives" was afterwards made from the French edition, Amyot's dissemination of Greek literature had its effect upon English prose, as well as upon French.

Adams should have a Memorial in the Royal College of Surgeons.

But Adams's claim to distinction is not merely that of a translator of concise and often obscurely expressed Greek treatises, such as those of Hippocrates, but because of the care with which he examined for himself the passages in ancient authors bearing on points open to discussion, and of his erudite "*preliminary discourse*" on the Hippocratic treatises, and the innumerable annotations and references throughout that work. He is said to have made himself acquainted with every extant Greek writing, not Greek medical writings only; and there is ample proof throughout this translation of Hippocrates, of his wide knowledge of Oriental, English, and European commentators and historians who have discussed the works of Hippocrates.

The period at which Hippocrates was practising his pro-ssion was "one of the most memorable epochs in the intel-ctual development of the human race," and Adams shows a miliarity also with the lives of all the great statesmen, tists, and scholars of that time. Indeed, Adams's erudition as so remarkable, and was developed so largely amidst the terruptions and distractions of medical practice, that there ight to be a bust or some other form of memorial of him in le Royal College of Surgeons of England, to mark the onour he is to his College, and to record the extraordinary egree of literary culture to which he attained whilst scharging to the full the duties of a general medical actitioner.

But notwithstanding the truth of the above appreciation Adams's erudition, some consideration of others ought to be iown before accepting off hand the title accorded to Adams y the *Medical Times and Gazette* (1861) of "Doctissimus ritannorum," and more especially before we claim for him le position of the most learned physician in Europe.

Linacre and Rabelais.

In this connexion something requires to be said about inacre for England, and Rabelais for France. Linacre 460–1524) lived at a critical period in the history of learning, hen the world was entering on a crisis, passing from the ediævalism of the schoolmen to the wider culture of le "New Learning." Rabelais (1495–1535) came somewhat ter, but was one of the most notable writers and thinkers the early days of the French Renaissance. Linacre had ceived an incentive to the study of Greek at the Cathedral hool at Canterbury, and, after election to a Fellowship All Souls' College, Oxford, he, with Colet (1467–1519) and few other Oxford scholars visited Italy, in 1493, and there came imbued with the learning and spirit of the Italian enaissance. England was a long way behind France and ill further behind Italy in exorcising the old conditions of ediævalism and introducing the humanities of the Renais-nce; but in Paris, on their way back to Oxford, Linacre d Colet came into touch with the two men who were preme in their influence upon European scholarship in the tter part of the fifteenth century and the first half of the cteenth century. These two men were Guillaume Budé udæus) and Erasmus, who were exact contemporaries of le another, having been born in 1466–67.

France had now gone ahead of Italy and become the centre European Greek culture and literature; and foremost in ance was Budæus, a Frenchman and a teacher of Greek in e University of Paris, who became the most famous an in Europe as an author on Greek philology, Roman law, d on education generally. Erasmus, the Dutchman, hose scholarly genius was developed in France, was the ly rival of Budæus, but was not his equal in Greek, though perior to him in style in the writing of Latin. Linacre and let formed ties of close friendship with these two men, upon iom in turn they exercised a marked influence; and on eir own part, by their eager study of Greek, they not only uminated the darkness which prevailed in England in the riod preceding the English Renaissance, and took the lead the revival of classical literature and the humanistic ovement in England in the Tudor period, but made some pression on contemporary European culture, in which nacre and Sir Thomas More, especially, played distin-ished parts.

Budé's influence on Colet was great and, under the zeal for ucational reform which he had imbibed from him, Colet unded, or re-founded and enlarged St. Paul's School in ndon for the study of Greek, as well as Latin.

Linacre also had a great regard for Budé and, in a letter ll extant, paid him a very high tribute of admiration. asmus, it is said, was one of Linacre's pupils in Greek, hers being Sir Thomas More, Prince Arthur, and Queen ary. Linacre closely studied the investigations of Aristotle d other Greek inquirers in natural science; he finally ncentrated his attention on the study of Greek medicine, d by translating the Greek works of Galen into Latin he quired Continental fame and spread widely the knowledge Greek medical literature. At home he founded the Royal llege of Physicians of London, and thereby did much ectly to organise the medical profession in England. nacre, like William Lily, the first Master of St. Paul's hool which Colet had re-founded, wrote a Latin Grammar iich obtained a great reputation abroad, and was very pular both with teachers and pupils on the Continent, as ll as at home.

No other classical scholar in British medicine has ever ercised so deep and wide an influence on classical literature d humanistic culture, outside his own country, as did nacre. In spite of the efforts of Linacre and Colet, how-er, Renaissance teaching was not to any great degree cepted by the English. This was shown by the coldness d indifference which More's "Utopia" met with in gland and the welcome given to its appearance on the ntinent.

Sir Thomas More's "Utopia."

Sir Thomas More (1478–1535), the author of the great political and social essay "Utopia," was 18 years younger than Linacre, and 11 or 12 years younger than Colet, Budæus, and Erasmus. When at Oxford, young More had Colet and Linacre for his tutors, and subsequently enjoyed the friendship and warm attachment of both Budé and Erasmus. But though it was through his circle of friends at Oxford that More was first smitten with the spirit of the "New Learning," it was his acquaintance with Erasmus—which began in 1498 or 1499—which caused him to return later with ardour to the study of Greek and the earnest pursuit of humanism. He published translations from the Greek and excelled beyond the average English scholars in writing Latin. His "Utopia," which was written in Latin and published in 1516, first at Louvain and then in Paris, was a contribution to European rather than to English literature. Through the kindly influence of Budé and Erasmus, "Utopia" took a prominent place in France, and edition after edition in the original Latin was issued from the Continental press. It was not translated into English until 35 years (1551) after it was first published in Latin, and a French translation appeared some time before it was rendered into its author's native language.

More's Influence on Rabelais.

A very notable feature of More's "Utopia" was the deep interest it aroused in Rabelais and the familiarity with its contents which is shown by Rabelais in his celebrated work, "Gargantua and his giant son, Pantagruel." Rabelais was greatly indebted to More. It would not be in place here to describe the similarity between Rabelais's story and More's political and social romance; but it is worthy of mention when passing on to consider Rabelais's reputation as a physician. I have on a previous occasion, in the columns of THE LANCET (1910, vol. i., p. 1155), written of this side of Rabelais's life, and if I again allude to it now, it is to speak of his scholarship in relation to his comparative eminence in medicine. Until the end of the fifteenth century, Greek was not known in France, but in 1495, the year of Rabelais's birth, a small coterie of scholars, including two physicians, was formed in Paris for the express study of Greek. Rabelais had previously studied Greek under difficulties, but when 25 years of age he got into communication with several members of this coterie, and with Erasmus, the leading scholar in Europe. One consequence of his acquiring Greek was that when lecturing in Montpellier, Rabelais was able to base his lectures on the Greek original of Galen, and on his own copy of the ancient manuscript of Hippocrates, instead of upon the mutilated and imperfect Latin translations used by former professors.

Rabelais had been a medical student in Paris and took his degrees in medicine in Montpellier in 1530 and 1537. He gave anatomical demonstrations on the human body both in Montpellier and Lyons, he invented certain surgical instruments, and with the sanction of the Holy Father, he was allowed to practise the art of Medicine for Charity, not for gain, and without using either the cautery or the knife. He was described by a contemporary as the "honour and sure glory of the healing art," and a Latin ode was written about him, in which it was said that by his skill he was esteemed the most eminent physician in France. But the renown of both Linacre and Rabelais, though eminent as practitioners of medicine, rests especially upon the distinction they acquired in general culture and classical literature, and upon their influence in promoting the "New Learning" throughout the civilised world.

FEMININE PSYCHOLOGY.

A WORK demanding that woman, unfitted for anything else by her manifold vices and imperfections, must have her powers curtailed and be restricted to the exercise of her reproductive functions, is something of an anachronism. That her vices result from a biological need is Mr. Ludovici's[1] vindication of her, and the vices are fully and feelingly described. The author writes in the style of the author of "Lovely Woman," but, unlike Mr. Crosland, takes himself seriously; so seriously, indeed, that he regresses to that primitive phantasy which psychologists call "the omnipotence of thought." What he thinks ought to be, is. Fertilisation is a natural process in woman; its absence leads to physiological disappointment, which "sings in chorus with the psychical disillusionment"; then she seeks a co-respondent; hence follows the frequency of divorce. The author thinks this ought to happen, so it happens. The control of conception ought to be harmful, so in the man "ultimate anæsthesia is inevitable." The thesis requires that woman should be unfit for sports; unfit she is, especially during her "moments of indisposition," and her violent sports, by a round-about pathology, lead to "very obscure but severe nervous disorders in later life." Perhaps the account of this last para-physical process only indicates an unquestioning belief in grandmotherly doctrine, and one comes to think that the author's attitude is a defence against the feminine in his own make-up, especially when he tells us (p. 352) that "it is enormously difficult for a woman to divorce her wishes, her likes and dislikes, from her beliefs and from her conclusions."

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[1] Woman: A Vindication. By Anthony M. Ludovici. London: Constable. 1923. Pp. 378. 12s.

After a talk on the national downfall that is about to follow the growth of feminism, the author says, "We cannot now with any pretence of honesty or good faith claim that it is a plunge into the unknown." This tribute to the physical reality of the phantasy concludes a book that is not so startling as the picture on the wrapper would indicate.

"THE FIGHT AGAINST DISEASE."

THE July issue of this little journal, published by the Research Defence Society at the price of 6*d*., and sold by Macmillan and Co., Ltd. (St. Martin's-street, London, W.C. 2.), contains the accounts and the Committee's annual report, signed by Lord Knutsford as chairman, together with pithy notes on the world's health, and illustrated articles regarding small-pox at Gloucester and in the United States (with a letter from Prof. Keen of Philadelphia), and tuberculosis treated by heliotherapy in Switzerland. Its pages are few but piquant.

POPULAR ENDOCRINOLOGY.

IN a scholarly little book on "Ductless and Other Glands," recently published (George Allen and Unwin. 4*s*. 6*d*.) Dr. Fred. E. Wynne, the versatile medical officer of health for Sheffield, gives a popular description of the results of recent endocrine research and the application of this knowledge to the prevention and cure of disease. Thyroid, parathyroid, thymus, suprarenal, pituitary and pineal are taken in succession and their secrets laid bare. Finally, Dr. Wynne deals with the ability of extracts of glands to renew the youth of man. In spite of the work of Voronoff on monkey glands, he warns the reader only to accept such conclusions on overwhelming evidence. The cycle of growth, maturity, and decay is a law of nature that governs suns and solar systems, as well as the protoplasm that crawls and swings for a time on the surface of this little planet. Man's only demonstrable immortality is his power to beget and transmit his qualities to his offspring. Dr. Wynne concludes that if youth and maturity were rightly used, if social conditions were what they might be made, old age would be as physiological a period as any other, and probably no less pleasant, a tranquil preparation for a welcome cessation of consciousness.

PUBLIC HEALTH IN NIGERIA.

Mr. A. C. Burns, assistant secretary at Lagos, is responsible for the annual general report for 1922 on the Colony and Protectorate of Nigeria, situated on the northern shores of the Gulf of Guinea. According to this report the general health was good throughout the year, the gravest problem presented during the period being a recrudescence of cerebrospinal fever in epidemic form. The outbreak declared itself in the north-eastern region of the Kontagora Province—i.e., immediately south of the eastern limit of the epidemic of the previous year. At first its aspect was gravely menacing, but all available precautions were taken, and, in the end, the advent of the rains found it happily still localised within the region of recrudescence, wherein it finally subsided. In the autumn the Emir of Katsina reported its existence in the French territory across his northern boundary, but the end of the year left Nigeria free from the visitation. A "health week" was organised in Lagos in November, and prizes were offered for the healthiest babies and the best-kept compounds. The people were much interested, and an immense quantity of accumulated refuse was disposed of during the week. The population of Nigeria is approximately about 18¾ millions—larger than that of any British dependency except India. There are about 4000 Europeans temporarily resident in Nigeria, chiefly in the employ of the Government, and of mercantile and mining companies. The country is not suited for European settlement. Of the native inhabitants the greater number are of pure negro race, but in the north there are Berber and negroid tribes. The seasons in Nigeria depend rather on the rainfall than on temperature. They are, as a rule, well defined. The dry season, with its attendant "harmattan," commences in the north of the country in October and ends in April. It is of shorter duration in the south, and at Lagos generally lasts from November to March with only intermittent "harmattan." During the "harmattan" (a dry north-easterly wind which brings with it a thick haze composed of minute particles of dust and shell) the nights and early mornings are cold, but the days are very hot, and it is during this period that the maximum diurnal variations occur. Under the heading "General Observations," in Mr. Burns's report, we find the following: "One of the principal religious obstacles to the advance of Christianity in tropical Africa is the prevalence and popularity of polygamy. Among the followers of Islam this institution has, of course, the sanction of religion. Among the non-Muslim tribes it has the equally strong sanction of immemorial custom. In West Africa children are assets rather than liabilities, the daughters being easily marketable as wives at an early age and the sons providing an unpaid labour supply; wives, besides their value as mothers, perform most of the manual labour in the house and on the family farms, but the custom which requires a mother to deny herself to her husband for the period during which she is nursing her child, often from two to three years, is, perhaps, the greatest cause of polygamy. The Native African Church, modelled in other respects on the Church of England, but allowing to its members a plurality of wives, has met the difficulty of those who wished to adopt the Christian Creed without abandoning one of the most cherished of their ancestral customs."

THE PEKING UNION MEDICAL COLLEGE.

THE Peking Medical College grew out of a small dispensary, originally founded at Peking by William Lockhart, of the London Missionary Society, in 1861. The work slowly progressed until the time of the Boxer rising, when all the buildings and plant were destroyed. After the rising, work was begun again in 1906, and various other missionary societies, both British and American, joined together to found the Union Medical College. This College continued to grow until 1914, when the Rockefeller Foundation despatched its Commission to China to study the question of medical education there. As a result the China Medical Board purchased the entire plant and arranged for the complete reorganisation of the school under charter from the University of the State of New York. A volume[1] recently published describes the ceremonies and the conference held in September, 1921, being some 60 years since the foundation of the first medical mission in Peking in 1861.

The College is equipped with the very latest apparatus and plant necessary, not only for the treatment of patients, but also for medical education and research. It is apparently doing admirable work, and, as medicine seems to be the one subject upon which men of all creeds and nationalities can agree, its activities should go far towards bringing about that union between nations in which the hope of the world lies to-day.

---

[1] Addresses and Papers; Dedication Ceremonies and Medical Conference: Peking Union Medical College, Sept. 15th–22nd, 1921. Peking, China. 1922. Pp. 416.

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith-road, W.

MONDAY, August 13th.—10 A.M., Mr. Maingot: Surgical Pathology. 12 noon, Mr. Simmonds: Applied Anatomy. 3 P.M., Mr. Simson: Diseases of Women.

TUESDAY.—10.30 A.M., Dr. Paterson: Medical Wards. 12 noon, Dr. Burrell: Chest Cases. 2.30 P.M., Mr. Tyrrell Gray: Surgical Wards.

WEDNESDAY.—12 noon, Mr. Sinclair: Surgical Dyspepsia. 2 P.M., Mr. Gibb: Eye Dept. 3 P.M., Dr. Pernet: Skin Dept.

THURSDAY.—10 A.M., Dr. Grainger Stewart: Neurological Dept. 12 noon, Mr. Simmonds: Demonstration of Fractures. 3 P.M., Dr. Scott Pinchin: Medical Out-patients.

FRIDAY.—10 A.M., Mr. Dudley Buxton: Dental Dept. 2 P.M., Dr. Burrell: Medical Out-patients. 2 P.M., Mr. Sinclair: Surgical Out-patients.

SATURDAY.—10 A.M., Medical Registrar: Diseases of Children.

Daily, 10 A.M. to 6 P.M. Saturdays, 10 A.M. to 1 P.M. In-patients, Out-patients, Operations, Special Departments.

INDEX TO "THE LANCET," VOL. I., 1923.

THE Index and Title-page to Vol. I., 1923, which was completed with the issue of June 30th, is now ready. A copy will be sent gratis to subscribers on receipt of a post-card addressed to the Manager of THE LANCET, 1, Bedford-street, Strand, W.C. 2.

THE LANCET

No. 5216. LONDON, SATURDAY, AUGUST 18, 1923. Vol. CCV.

CONTENTS

THE WHOLE OF THE LITERARY MATTER IN THE LANCET IS COPYRIGHT.

CRITICAL INVESTIGA-TION into the Thermal Death-point of the Tubercle Bacillus in Milk, with Special Reference to its Application o Practical Pasteurisa-ion. By F. W. CAMPBELL BROWN, I.D., Ch.B., D.P.H. ... 317

ORIGINAL ARTICLES.

te-Natal Diagnosis. By RANCES M. HUXLEY, I.D., B.Sc.—(*Illus-ated*) 321

plyte Tuberculin. By LIVE RIVIERE, M.D., .R.C.P. 324

ee Cases of Bilateral enal Calculus. By HARLES NOON, F.R.C.S. 325

odenal Diverticula, with eport of a Case of angrenous Diverticu-tis. By G. P. B. UDDY, M.S., F.R.C.S. —(*Illustrated*) 327

ther Research on the elation of Carcinoma Infection. By W. M. ORD ROBERTSON 330

VIEWS AND NOTICES OF BOOKS.

edity and Eugenics. y Prof. R. R. Gates, h.D. 333

nia and its Radical ure. By J. Hutchinson, .R.C.S. 333

Gesichtsausdruck und eine Bahnen, beim esunden und Kranken esonders beim Geistes-anken. By Prof. Dr. heodor Kirchhoff 334

calotte cornéo-scleral. y Dr. F. Terrien...... 334

ammation of Bones and ints. By Prof. Leonard . Ely, M.D. 334

-Azar. By L. Everard apier, M.R.C.S., R.C.P., and Ernest uir, M.D., F.R.C.S.... 334

n 335

nal of Pathology and acteriology 335

LEADING ARTICLES.

LONDON WATER 341

THE TREATMENT OF INFECTIONS OF THE HANDS... 341

DOCTORS AND UNCERTIFIED MIDWIVES 342

ALTERATIONS OF VIRULENCE BY PASSAGE.... 342

ANNOTATIONS.

Prof. Leonardo Bianchi on Old Age 343

Familial Retino-Cerebral Degeneration........ 344

Voluntary and Poor-law Hospitals 344

Mistaken Chest Signs..... 344

Accidental Syphilis in Medical Men 345

Work of the Rockefeller Foundation 345

The Fight against Rabies in Dogs 346

The Production of Clean Milk 346

International Conference on Leprosy 346

Decapsulation of the Kidney in Eclampsia... 347

The Middle Way in the Treatment of Functional Nerve Disorders 347

Prof. Ivan Pavlov in London 348

MODERN TECHNIQUE IN TREATMENT.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

XXXIII.—Treatment of Syphilis in the Woman of Child-Bearing Age. By Dr. MARGARET RORKE 348

PUBLIC HEALTH SERVICES.

Reports of Medical Officers of Health: Hertfordshire.—Herefordshire.—West Gloucestershire.—Dumfries.—Doncaster.—Guildford.—Stockton.—Bridlington 337

School Medical Service: Bristol. — Colchester.—Swindon 338

SPECIAL ARTICLES.

The Pasteurisation of Milk: A Report by the Ministry of Health 338

Factory Inspection in 1922: Report of the Chief Inspector 349

Congress of the Royal Sanitary Institute at Hull 350

Public Health Legislation in the Irish Free State.. 351

United States of America: Control of Urine Sugar under Insulin Treatment 352

Vienna: Insulin Treatment in Vienna........ 352

Budapest: Treatment of Terminal Hæmaturia... 353

BRITISH MEDICAL ASSOCIATION.

Annual Meeting at Portsmouth.

Section of Medicine: Diabetes.—Heart Disease in Early Life.—Chronic Bronchitis 354

Section of Laryngology and Otology: Internal Ear Deafness.—Spasm of the Larynx 358

Diseases of Children: Acidosis and Alkalosis in Children. — Summer Diarrhœa 360

Exhibition of Instruments, Drugs, Foods, and Appliances 362

NEW INVENTIONS.

A New Urethroscope and its Use as a Vaginoscope for the Treatment of Vulvo-Vaginitis in Children (Col. L. W. Harrison, D.S.O.).—(*Illustrated*) 336

THE SERVICES.

Royal Army Medical Corps.—Royal Air Force..... 363

CORRESPONDENCE.

X Rays in Exophthalmic Goitre (Prof. Arthur H. Burgess) 364

A National Pathological Museum (Dr. Ernest H. Shaw) 364

Sailors and Venereal Diseases (Miss E. O. Grant) 364

Village Settlements for Ex-Service Men (Dr. P. C. Varrier-Jones) ... 364

University Elections in the New Dail (Dr. T. Hennessy) 365

The Imperial Cancer Research Campaign and the Cancer Problem (Dr. J. A. Murray) 365

MEDICAL NEWS.

Roy. Coll. Phys. Lond. and Surg. Eng. 365

Roy. Coll. Phys. Edin., Roy. Coll. Surg. Edin., and Roy. Fac. Phys. and Surg. Glasg. 366

Donations and Bequests.. 340

King's College Hospital .. 348

The late Dr. J. R. Stenhouse 353

International Union against Tuberculosis ... 366

National Milk Conference. 367

Salford Milk-supply 367

Milk (Special Designations) Amendment Order (Scotland), 1923 367

Middlesex Hospital Medical School 367

London Inter-Collegiate Scholarships Board 367

Wellcome Historical Medical Museum....... 367

Small-pox in England and Wales 367

Code Words for Medical Telegrams 367

Cancer Research in Manchester 367

Death of Dr. J. Ferguson 367

Industrial Welfare Society 367

NOTES, COMMENTS, AND ABSTRACTS.

The Hygiene of Swimming: Some Feats of Endurance.—The Dangers of Swimming Pools 368

Public Health in Cairo .. 369

The Effect of Bacterial Extracts on Blood-sugar 370

To Parents of Defective Children 370

A Tuberculosis Directory . 370

The San Francisco Medical Meeting 370

Medical Diary 367

Appointments.—Vacancies 368

Births, Marriages, Deaths. 368

HE ANIMAL PARASITES OF MAN.
I. B. FANTHAM, M.A., **J. W. W. STEPHENS**, M.D., D.P.H., and **F. V. THEOBALD**, M.A.
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A Critical Investigation
INTO THE
HERMAL DEATH-POINT OF THE TUBERCLE BACILLUS IN MILK,
WITH SPECIAL REFERENCE TO ITS APPLICATION TO PRACTICAL PASTEURISATION.

BY F. W. CAMPBELL BROWN, M.D.,
CH.B. ABERD., D.P.H.,
TE SENIOR ASSISTANT LECTURER AND CARNEGIE RESEARCH SCHOLAR, UNIVERSITY OF ABERDEEN.

THE thermal death-point of the tubercle bacillus milk is a question to which many workers have ven answers, but so discrepant have been the results at it would appear necessary that this work be vised and any possible previous sources of error minated by strict observance of care throughout e experiments. Further, it would appear neces-ry to have more definite results when one takes to consideration the prevalence of bovine tuber-losis among human beings at the present day—the ajority of all such infections being transmitted by e milk of tuberculous cows. Milk-borne epidemics of phoid, dysentery, &c., are not only historical facts, it also present-day occurrences, and neither the lation of "carriers," nor the application of the ost recent methods for early diagnosis of infectious sease amongst cows and milk workers will make e danger of milk-borne epidemics a thing unheard . Considerations such as the above have led to the lief that a further attempt should be made to tain information which would help to render such universally used and essential food [illegible] milk a less ngerous article for consumption in human dietary. Beneficial methods of treatment other than steurisation have been devised and used to render lk sterile. The addition of preservatives—e.g., ric acid, &c.—was sometimes used, but this is not practice to be advocated. The quality of any such eventive required to destroy the tubercle bacillus milk would be harmful to the tissues of the human dy. Boiling the milk would in all probability stroy the tubercle bacillus, but in this case certain rmal constituents of the milk are destroyed, and thout these such milk becomes a much less valuable ticle of diet than in its fresh state. Electrical ethods are being adopted in America and in Liver-ol with some degree of success. This is an expen-e method of treatment, and it has been shown that is not any action peculiar to the electric current hich sterilises the milk. Rather the action is due the heat set up by the electricity [illegible] it flows through e apparatus.

The question of attacking the bovine tuberculosis the human being at its source—i.e., in the cow—has en receiving much attention in recent years. The plication of the tuberculin test, the better super-sion of byres, and other factors which lead to althy non-tuberculous herds, are all steps in the ght direction; but to rid the country of all its berculous cattle is going to take [illegible] considerable ne, and will require more stringent legislation than at present in force. Even although tubercle-free rds have been installed throughout the country, steurisation will still remain as the best safe-ard for getting rid of other contamination from irces other than the cow.

With these points in view, it will be necessary to nsider the question of the thermal death-point of e tubercle bacillus from every possible angle to able one to say that the pasteurisation process ed is of decided value. The results obtained by evious workers must be noted and their methods refully considered from the practical point of view.

EVIOUS ATTEMPTS TO DETERMINE THE THERMAL DEATH-POINT OF TUBERCLE AND OTHER BACILLI.

At varying periods numerous workers have added eir names to the now long list of investigators on this subject, giving, for the temperature factor 60° C., time factors varying from five minutes to eight hours as the necessary exposure of the bacilli to that degree of heat in order to destroy them. Many attempts have also been made to state [illegible] time factor when the temperature used was 70° C., but here, again, the results recorded are widely conflicting, varying from 1 to 45 minutes' exposure. Table A is [illegible] list (taken from Delépine's Food Report No. 79) of results obtained by various workers who used 60° C. and 70° C. [illegible] the temperature factors—the temperatures used also in the writer's experiments.

TABLE A.

Investigator.	Temperature used.	Time found necessary to kill the bacillus.
Yersin (1888)	60° C.	10 mins.
Bitter (1890)	,,	5 mins. sometimes enfeebles.
Bonloff (1892)	,,	20 mins.
Forster (1892)	,,	6 hours.
De Man (1893)	,,	1 hour.
Schraeder (1894)	,,	15 mins.
Woodhead (1895)	,,	(*a*) 8 hours (*b*) 45 mins.
Theobald Smith (1899) ..	,,	15–20 mins.
Russell and Hastings (1900)	,,	20 mins.
Hesse (1901)	,,	20 mins.
Rosenau (1907)	,,	20 mins
Delépine (1914)	64°–92° C.	Not killed in 39 mins.
Bang (1891)	70° C.	5 mins. only enfeebles.
Grancher and Lideux-Lebard (1892)	,,	1 min.
Woodhead (1895)	,,	(*a*) 45 mins. (*b*) 1½ mins.
Morgenroth (1900) ..	,,	10 mins.
Russell and Hastings (1900)	71° C.	1 min.

POSSIBLE CAUSES OF VARYING RESULTS PREVIOUSLY RECORDED.

(*a*) The tubercle bacillus may vary in different cases in its resistance to heat; and in order to get over this difficulty, it is essential that as large a number of different strains as available be tested. Rosenau used five different strains in his experiments, whereas Delépine used milk infected by one animal to which cultures of another strain were added, thus having a mixture of only two strains.

(*b*) Variation of results may also be due to: (1) The fact that the only way to determine whether tubercle bacilli are alive or not after pasteurisation is by animal inoculation, necessitating much delay for obtaining results; (2) the difficulty in some cases in differentiating a lesion seen at post-mortem resulting from dead bacilli from that due to live bacilli; (3) the fact that somewhat similar post-mortem appearances are produced by pseudo-tuberculous lesions, caused by an entirely different organism. Only by searching for acid-fast bacilli can [illegible] differentiation be made in such cases.

(*c*) There is also the difficulty in obtaining standard and uniform dosage of bacilli for the animals—it being a well-known fact that the extent and rapidity of spread of the disease depend to some extent on the numbers of bacilli injected. Again, the period of time which elapsed before the animals were inoculated and examined may not have been uniform; and this is important, [illegible] Delépine points out that the disease produced by heated bacilli remained latent or occult for some four weeks in his set of experiments. Unless sufficient time elapses before the animals are examined, latent lesions may be missed. This point is brought out in Tables II. and III. of his report.

(*d*) The method of arriving at the exact temperature of the infected milk must essentially be taken into account. In all pasteurising plants the milk is *rapidly* raised to the desired temperature, the time taken being only a few seconds.

In the laboratory it is difficult to do this. The time required to raise the infected milk to the requisite temperature is much longer. The organisms are consequently being exposed to the slowly increasing temperature of the milk while the experimenter is waiting for it to reach the desired 60° C. at which the exposure factor comes into play. I am of the opinion that, because the bacilli are being subjected to, say, 50° C. to 60° C. for a variable period, some may be killed, and all to an extent enfeebled, before the temperature of the milk reaches 60° C. In Rosenau's experiments, the bacilli were added to the cold milk and received a critical heat during the time the milk was being raised to 60° C. before the time factor was taken into account.

(*e*) Further, the method of maintaining a uniform temperature of 60° C. throughout the test, and recording the same, must be provided for. In both these points (*d*) and (*e*), Delépine's experiments cannot be truthfully compared with those of Rosenau's. The temperature used in Delépine's tests was a steadily rising one. On page 41 of his report, the words "the heating of milk from 12° to 78° in 29 minutes" do not agree with the figures given for time and temperature on page 6, and to which the paragraph on page 41 evidently refers. According to the figures on page 6, the time taken to raise the mixture from 12° to 78° was *19 minutes.* The milk remained at or above 60° for only seven minutes, when his sample (3) was taken at 78° and found to contain living bacilli. He also goes on to state in the same paragraph that after ten minutes more the sample (4) taken was found infective. The mixture had not 20 minutes' exposure to heat at or above 60° when this sample was taken, but only 18 minutes. He had no further sample taken for 72 minutes after this, and this was found sterile. His statement, therefore, cannot be correctly used to disprove Rosenau's belief—i.e., that tubercle bacilli are killed in 20 minutes at 60° C.

(*f*) Perhaps of all the possible causes for these varying results the most important is the container used, in which the test milk has been pasteurised; and it is only comparatively recently that more exact methods have been employed. It has been usual for the investigator to heat the infected milk in test-tubes, which were then immersed in a hot water-bath standing at a regulated temperature. With such a method there are two possible sources of error. Firstly, the test-tubes being open to the atmosphere, a surface scum forms on the milk. Bacilli find in this scum a certain degree of refuge from the heat, and a scum such as this will not maintain the same degree of heat as the deeper portions of milk, which will always be in circulation. Smith found that when no scum was allowed to form on the surface of the heated milk, as by heating it in closed vessels, tubercle bacilli were killed at 60° C. in 15 minutes, whereas when a pellicle was allowed to form these organisms survived for one hour at the same temperature. Secondly, there is the obvious danger of splashing the sides of the tube with live bacilli, which may quite easily contaminate the pipettes used for withdrawing later samples, when the bacilli withdrawn from the fully heated portion of the milk are by that time killed. And a further objection is that, by capillary attraction and by withdrawing sample after sample, a film of infected milk is left on the interior walls of the test-tube above the milk level. The inevitable result must be that numerous bacilli escape the full heat for a varying period, and tend slowly to fall by gravity into the bulk of milk, only to reinfect it after it might otherwise have been rendered sterile.

This appears to be the drawback to Rosenau's method, which was that described above. So also Twiss used an open flask when she carried out similar tests, using paratyphoid bacilli in her experiments. Her conclusion—i.e., that the results got by taking small amounts of test samples cannot be taken as proof that all the organisms are killed after periods of exposure used in practical pasteurisation—would appear to be due to the fact that a few organisms remain unexposed to the heat. These are not removed in the small amounts taken for inoculation of "sugars" or animals as the case may be. This vital point has been commented upon by Krumwiede and Noble, who repeated this work. These investigator made a distinct step forward when they adopted th plan of *totally immersing* the milk sample containe in the water-bath, thus ensuring that all organism present were exposed to the required degree of hea for the required period of time. In their exper ments, measured quantities of sterile milk wer placed in separate containers, submerged in a water bath till the temperature of the milk reached 60° C and then the emulsions of organisms were added Each container with a rubber stopper was the *totally* immersed in the water, removed after a pre determined time, and immediately cooled.

This method undoubtedly has distinct advantage over the open test-tube method, but it is not fre from comment. The technique is good, but require finer detail in order to get absolutely correct an uniform results. First, there is no method of registering the temperature of the milk throughout th experiment. Krumwiede and Noble make no mention of having a thermometer inserted through th rubber cork of the containers. The necessity for thi is borne out by the fact that, when I originall thought of employing similar methods in the following tests, I found that by inserting a thermomete through the stopper and placing the container o the bottom of the hot water oven and totally immersing it, the temperature of the fluid inside the container exceeded that of the water bath by 2·5-3 as a rule. On one occasion it was actually 10 warmer. It was not until after many attempts ha been made to explain this anomaly that it was foun to be due to the fact of the container resting on th metal bottom of the bath, which was warmer tha the water. (The bath was heated from below by gas jet.) On the other hand, if the container wa *suspended* in the water and just clear of the botton of the bath, the temperature inside the containe coincided with that of the water in the water-bath And, further, Krumwiede and Noble make no mention as to whether or not they provided for a lowerin of the temperature of the milk standing at 60° C when the emulsion of bacilli, presumably at roon temperature, was added.

The necessity for guarding against this lowerin of temperature was borne out by the writer addin 1 c.cm. of emulsion at 37° C. to 5 c.cm. milk standin at 60° C. The result was that the temperature o the milk emulsion at once dropped 7–8° C. And it was several minutes before the temperature of the infected milk rose to the figure (60° C.) at which the time factor comes into play. More especially is thi to be considered when results are to be given in suc short periods as minute intervals. It is, therefore necessary before exact exposure periods can be obtained that certain preliminary adjustments be made to the apparatus and temperatures used before beginning any tests on the thermal death-point of any micro-organism. In my experiments such preliminary data were carefully prepared for use with a specially-made apparatus for subjecting infected milk to the degree of heat to be used. These, and the apparatus, will be later described in detail.

Methods Used in Personal Experiments.

The various cultures of tubercle bacilli used in the following experiments were obtained in the majority of cases from tuberculous ox glands, tuberculous milk, human tuberculous sputa, tuberculous joints and bones in man, &c. In addition, a few cultures were obtained from France, Germany, and the United States of America in order to ascertain whether a more resistant type of the tubercle bacillus existed in countries whence cattle are exported for use as human food in the United Kingdom. In all, 35 different sources were used for obtaining strains, some of which might possibly be more virulent or have a greater resistance to heat than the others. All those used were obtained since January, 1921, none being over eight months old, and the majority very much less.

Many weeks were spent in trying to isolate pure cultures from the tuberculous material obtained, and was not ascertained till numerous attempts had een made by the antiformin method advocated by [uir and Ritchie that the chlorine content of the ntiformin varied with different supplies. It became vident that little or no success was likely to be btained by this method, and the more recent technique, as used by Griffith, was employed, and with uch greater success. In this method it matters ttle whether the chlorine content of the antiformin aries or not, as will be understood by the technique nployed by the writer. In this case 10 per cent. ntiformin solution was added to an equal volume the sputa, &c. The mixture was rapidly shaken, id single loopfuls were sown on to culture edium after varying lengths of time—e.g., after xposures of 1, 3, 5, 10, 15 and 30 minutes. In is way a point is reached when all extraneous rms are killed, and only the more resistant tubercle acilli remain alive. The most usual result found as that the culture tubes inoculated with tuberculous aterial exposed to the antiformin for less than five inutes were contaminated by the extraneous germs. n the other hand, pure growths of tubercle appeared either the 5, 10, or 15 (more usually the latter two) ilture tubes. Very rarely were any cultures btained from the tubes inoculated with sputum hich had been exposed to this percentage of antirmin for 30 minutes. With such a lengthy exposure e bacilli were evidently killed. In a few cases the acilli withstood this length of exposure to 10 per nt. antiformin; this was possibly due to the sputum ing thicker and more tenacious, as Griffith suggests. the case of ox glands, shorter exposure of the seous material was found to give the best growth media. Such material would appear to protect e tubercle bacilli to a less extent than does tenacious utum.

The only disadvantage in this method is the cessity of using six tubes of culture material for ch attempt instead of one or two. The time used, wever, is shorter than in the older method, where much use of the centrifuge for washing out the kaline antiformin after exposure to the tuberculous aterial is necessary. In order to utilise less culture edium small tubes were used for the primary owth, and from the one containing the pure growth bcultures were sown on large tubes in order to tain sufficiently abundant growths to perform the rther experiments.

The culture media used for obtaining growths were ther the egg medium advocated by Dorset, or a odification of the same. In some cases Petroff's edium was employed for the original attempts, iere pure growths were difficult to obtain, but it peared that the gentian violet as used somewhat nded to inhibit the tubercle bacilli as well as the ntaminating organisms. The best results, especially ien the method of sowing as used by Griffith as adopted, were obtained by using ordinary egg edium with sufficient quantity of basic fuchsin ded to colour the medium dark pink, as suggested Cruickshank. By using such a medium the eam-coloured early growth was more readily cognised than when no fuchsin was added. The dition of the fuchsin did not appear in any way inhibit the growth, which could be observed even seven days in most cases.

Glycerine was added according to whether the rticular strain being isolated was from a human or vine source, and it must be said that although in ore recent views it is held that this substance nnot be relied upon to differentiate between the man and bovine types of this bacillus, the vine strains did not grow at all, or at any te only grew very slowly, on glycerine egg. though this fact was noted, this method was t used for differentiating the various strains ed in this series of investigations. After several nths, during which nothing was done beyond perimenting with different media and obtaining a sufficient quantity of pure cultures, the tal number of cultures exceeded 250 in number. This stock consisted of 35 strains obtained from different sources.

PREPARATION OF INFECTED MILK FOR PASTEURISATION EXPERIMENTS.

An emulsion of 0·2 g. dried bacilli and 1 c.cm. sterile milk was added to 5 c.cm. milk at a temperature of 67° C. in a specially designed flask. The flask was devised so that a thermometer could be kept in its interior. It had also a thin limb with a stopcock at the extremity for withdrawing samples of milk by means of a pipette at various stages of the experiments. The entire apparatus was kept completely submerged in a water-bath standing at 60° C., and only the stop-cock withdrawn momentarily when a sample was required. The effect of adding 1 c.cm. emulsion at room temperature was to lower that of the 5 c.cm. from 67° to 60° C. immediately, thereby enabling the experiment to be commenced at the temperature desired for the duration of the test. This precaution seems to have been overlooked by numerous workers, and would appear to be necessary, especially when the more delicate organisms are being dealt with. The samples withdrawn were of uniform quantity, quickly cooled to 30° C., and then inoculated into guinea-pigs, each pig receiving 0·02 g. tubercle bacilli in 1 c.cm. milk. Heavy infection was aimed at to ensure quick and decisive results.

In all, 25 strains of tubercle bacilli were tested in this manner, ten samples being taken at varying exposure times, and an unheated sample inoculated as a control for each strain. In order to ascertain whether or not all the bacilli were killed and none remained unexposed (in the apparatus) to the heat, organisms giving more rapid reactions than tubercle bacilli were used. That no live bacilli had escaped inclusion in the samples was proved by inoculating the whole flask and its remaining contents in suitable culture media.

INOCULATION OF TEST ANIMALS.

The guinea-pigs were inoculated at the flexure of the thigh, and each series was isolated from those used for the different experiments. No animal was killed before the tenth week after inoculation, in order to allow time for latent disease to become manifest, and in cases of doubt reinoculation with the doubtful lesions were made. The presence of the disease in the positive animals was in most cases quite definite, being made manifest by abscess-formation at the site of inoculation, enlargement of lymphatic glands, presence of tubercles or necrotic areas in the liver, spleen, lungs, &c.

RESULTS OBTAINED.

These are given in detail in the tables, which contain only a summary of the results obtained, and do not convey to the reader any idea of the vast amount of time and work spent in carrying out these experiments. The animals used, including those required for reinoculations, exceeded 280 in number; and the time taken in carrying out this part of the tests alone—i.e., in inoculating, supervising, and performing autopsies on them—extended over six months.

Tables I. and II. give all the results obtained with 15 bovine strains, using 60° C. as the temperature factor. It will be noted that in the great majority of cases ten minutes' exposure to this degree of heat is not sufficient to prevent the bacilli from causing tuberculosis in the guinea-pig, while even 15 minutes is not sufficient in some cases. However, a period of 20 minutes was found either to kill the bacilli or so to enfeeble them that the protective forces in the guinea-pig were able to prevent the latter from becoming tuberculous. Three strains, Nos. 3, 7, and 12, gave rather doubtful results after 20 minutes' exposure, but on reinoculation with the doubtful lesions no tuberculosis developed in any of the animals used. It was unfortunate that the control animal for strain No. 13 died accidentally, but the fact that the animals given this strain heated for 10 and 15 minutes developed tuberculosis proves that the strain was [illegible] virulent one, and it has therefore been included with the others in Table I.

TABLE I. (BOVINE STRAINS).—*Infected Milk subjected to 60° C. for Varying Exposures as stated below.*

Strain	C	Time of exposure at 60° C. (in min.)					Strain	C	Time of exposure at 60° C. (in min.)				
		10	15	20	25	30			10	15	20	25	30
1	+	+	–	–	–	–	9	+	–	–	–	–	–
2	+	+	–	–	–	–	10	+	–	–	–	–	–
3	+	+	+	–?	–	–	11	+	+	+	–	–	–
4	+	–	–	–	–	–	12	+	+	–	–?	–	–
5	+	+	–	–	–	–	13	–	+	+	–	–	–
6	+	–	–	–	–	–	14	+	–	–	–	–	–
7	+	+	–?	–?	–	–	15	+	+	–	–	–	–
8	+	+	+	–	–	–							

C, Control animal. +, Tuberculosis found at autopsy.
–, No tuberculosis found at autopsy.

Result.—All rendered non-lethal at or before 20 minutes' exposure to 60° C. Refer to Table II. for doubtful cases.

TABLE II.—*Confirmation Tests from Doubtful Lesions of Guinea-pigs in Table I.*

Strain.	Lesion from animal treated with milk at 60° C. for :—	Guinea-pig.	Guinea-pig.
3	20 minutes	–	–
7	15 ,,	–	–
7	20 ,,	–	–
12	20 ,,	–	–

Result.—Doubtful lesions as recorded in Table I. were found to be caused not by living but possibly by dead bacilli.

TABLE III. (BOVINE STRAINS).—*Infected Milk subjected to 70° C. for Varying Exposures as stated.*

Strain	C	Time of exposure at 70° C. (in min.)					Strain	C	Time of exposure to 70° C. (in min.)				
		1	3	5	10	15			1	3	5	10	15
1	+	+	+	–	–	–	9	+	–	–	–	–	–
2	+	–	–	–	–	–	10	+	+	–	–	–	–
3	+	+	–	–	–	–	11	+	+	–	–	–	–
4	+	+	–	–	–	–	12	+	+	+	–	–	–
5	+	+	–	–	–	–	13	+	+	+	–	–	–
6	+	–	–	–			14	+	+	–	–	–	–
7	+	+	+	–	–	–	15	+	–	–	–	–	–
8	+	–	–	–	–	–							

Result.—No virulent bacilli were found after 5 minutes' exposure to 70° C.

Table III. gives the results when the infected milk [illegible] heated at 70° C., using the same 15 strains of bovine tubercle bacilli. In this case no tuberculous lesions developed in any of the animals inoculated with infected milk which had been exposed to a temperature of 70° C. for five minutes. While the essential object of these tests is to determine the thermal death-point of the bovine type—the type which is most likely to be found in cow's milk—yet it should be borne in mind that there is always the possibility of contamination of milk by the human type of the bacillus. Contamination with the latter may occur from tuberculous dairymen. It is important, therefore, that the thermal death-point of the human type also be ascertained. For this purpose ten human strains were tested, and the results obtained are given in Tables IV. and V. It will be observed that there would appear to be little or no difference in the thermal death-point between the bovine and human types of this organism.

I believe that, when tuberculous milk is *heated either at 60° C. for 20 minutes or at 70° C. for 5 minutes, it can safely be assumed that the bacilli are killed.* If they are not actually killed, they are so enfeebled that the normal powers of resistance of the guinea-pig find the former an easy prey, and no tuberculosis develops. This statement can in all probability be applied to man. More especially is this the case when it is not to be expected that the milk he drinks would ever contain such numbers of bacilli as have been given to the guinea-pigs, each guinea-pig receiving 0·02 g of pure culture as a dose. Therefore, *tuberculou infection* from milk treated with either of these tw combinations of temperature and time factors ma be entirely disregarded from an administrative publi health point of view.

TABLE IV. (HUMAN STRAINS).—*Milk Infected whe at 67° C. and Mixture kept at 60° C. througho Exposure Periods.*

Strain	C	Time of exposure to 60° C. (in min.)					Strain	C	Time of exposure to 60° C. (in min.				
		10	15	20	25	30			10	15	20	25	3
1	+	+	–	–	–	–	6	+	+	–	–	–	–
2	+	–	–	–	–	–	7	+	+	–	–	–	–
3	+	+	–	–	–	–	8	+	+	+	–	–	–
4	+	–	–	–	–	–	9	+	–?	+	–?	–	–
5	+	–	–	–	–	–	10	+	+	–	–	–	–

Result.—In all cases an exposure of 20 minutes at 60° C. wa sufficient to render the bacilli non-virulent. Reinoculation doubtful results got with No. 9 proved negative.

TABLE V. (HUMAN STRAINS).—*Milk Infected when 77° C. and Mixture then kept at 70° C. througho Experiment.*

Strain	C	Time of exposure to 70° C. (in min.)					Strain	C	Time of exposure to 70° C. (in min.)				
		1	3	5	10	15			1	3	5	10	1
1	+	–	–	–	–	–	6	+	+	–	–	–	–
2	+	–	–	–	–	–	7	+	+	–	–	–	–
3	+	–	–	–	–	–	8	+	–	–	–	–	–
4	+	+	+	–	–	–	9	+	+	+	–	–	–
5	+	+	–	–	–	–	10	+	–	–	–	–	–

Result.—No virulent bacilli remained after 5 minutes' exposur to 70° C.

But because either method of treatment wi render milk free from infection, the effect of heat o the other constituents of the milk must not be disregarded; and it is now necessary to consider i both methods of treatment may produce equall good effects, or if there are sufficient grounds fo preferring one as opposed to the other.

There is evidence to show that the organism producing lactic acid in milk prevent the development of spore-forming organisms of the putrefactiv group. Therefore, the presence of the former in th treated milk is an advantage. Further, the effect o prolonged exposure to temperature exceeding 65° C has been shown to destroy valuable enzymes in th milk; and also the fat globules may be broken up and the "cream line" lost.

The question of the effect of heat on enzymes i milk has been studied by many workers, and th results obtained are given by Race. His result show that exposure to temperatures of 65° C. an under for a period of 30 minutes has no effect on th enzymes found in fresh milk. Numerous worker quote figures dealing with this question, but the mos recent and probably the most accurate authority o the subject is McCollum, who has done [illegible] muc valuable recent work on the nutritional value o various foodstuffs. The work of Hess and of McCollu together indicate that the effect of different degree of heat on the nutritional value of milk is extremel important in the consideration of scurvy in infant

Scurvy is considered by these workers as o bacterial origin, but the reasons cannot be gone int here. Sufficient it is to quote the conclusions com to by them. These are that milk heated to 74° C. fo 30 minutes is more liable to cause scurvy than mil which has been pasteurised at 63° C., or boiled. Th explanation given is that at 74° C. nearly all the lacti acid-forming bacilli are killed, and so the spore-formin bacilli alone remain, and in time bring about putrefactive decomposition. Further evidence is given t show that stale pasteurised milk augments the dange of development of scurvy in infants.

They further add that pasteurisation in itself does no seem to have any influence in lowering the nutritiv *lue of milk, but that pasteurisation should be carried t at the lowest temperature which will destroy the action pathogenic organisms, and the milk consumed soon ter treatment.*

With these facts in view it would, therefore, appear at the "flash" system as carried out in the majority dairies in this country is inferior to the "holding" stem, for the following reasons :—

(1) Exposure to 70° C. for a mere matter of a few conds does not destroy the action of the tubercle cillus.

(2) By killing the harmless lactic acid-forming cilli, the harmful putrefactive organisms are more adily allowed to develop ; and further—

(3) The fact that souring is prevented allows the lk to remain "sweet" to the housewife, whereas if our" it would not be used (vide ante—Scurvy).

(4) The possibility of the lactose becoming scorched, e casein hardened, and the calcium, magnesium, and osphoric salts precipitated, and also the commercial jection—viz., the "cream line" being interfered th.

As the "holding" system, using a temperature of ° C. and holding the milk thereat for at least 20 nutes, seems to have all the advantages and none of e disadvantages of the "flash" system, it is to be eferred.

CONCLUSIONS.

1. It has been shown that by using 25 strains of the bercle bacillus no wide difference in the thermal ath-point is found.

2. The thermal death-point of this organism is actically similar for human and bovine types.

3. The previous wide variations in results have en due to too little care in carrying out the experients, and to the fact that the lesions caused in test imals had not previously always been given sufficient ne to develop and be accurately diagnosed.

4. If a temperature of 60° C. be used, it requires minutes' exposure to this degree of heat to event milk so treated carrying infection to the inea-pig.

5. If a temperature of 70° C. be used, it requires five nutes' exposure to ensure the same results.

6. Of these two combinations of time and temperae factors, the former excels the latter, when the *d value* of the treated milk is also considered.

7. The writer is of opinion that, until bovine tuberosis can be stamped out at its source—namely, the ox—proper pasteurisation of milk is the only e method of rendering milk safe as a diet for nan consumption.

Vote.—Since the completion of these results in 1922 s interesting to note that, by the passing of the k and Dairies (Amendment) Act, 1922, and the ne of the Milk (Special Designations) Order, 1922, de by the Minister of Health under Section 3 of the 1 Act, *legislation now exists* whereby until July 1st, 3, any process of pasteurisation (including the ash" process) capable of effecting the necessary uction of bacteria was permitted. Subsequent to t date suppliers of pasteurised milk must conform certain conditions if the milk is to be sold as teurised milk. One of these conditions compares ourably with my results—namely, that the milk st be retained at a temperature of not less than ° F. (approx. 63° C.) and not more than 150° F. prox. 66° C.) for at least 30 minutes ; also that no er treatment of heat may be adopted. These its of temperature and duration of exposure give afe margin as far as ensuring the destruction of any ercle bacilli in milk thus treated.

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ANTE-NATAL DIAGNOSIS.*

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THIS is a large subject, and I propose dealing with it strictly from the clinical point of view, laying stress on the methods by which a diagnosis is come to. With it is very closely associated the actual diagnosis of pregnancy itself. Success in diagnosis is based on a routine method of examination, and the recognition of abnormal conditions on a wide experience of the normal.

The patient should always be prepared by emptying the rectum and bladder. The latter can be a particular source of trouble. Conditions which hinder diagnosis are nervousness on the part of the patient, difficulty in adopting the abdominal type of breathing, stoutness, and unduly developed musculature of the abdominal wall. The results of nervousness can usually be obviated by paying attention to the history and by examining other parts, such as the breasts, before beginning to palpate the abdomen. None of the manipulations involved in making a complete diagnosis should hurt a normal patient. Gentleness and patience are repaid many times over by the results obtained.

Early Stages of Pregnancy.

The diagnosis of pregnancy is usually possible from the end of the second month. In the history, points of value are amenorrhœa, a history of morning sickness, and pain and tenderness of the breasts. On examination at from eight to ten weeks the breasts rarely show anything of diagnostic value. On abdominal palpation one is usually conscious of some resistance above the symphysis pubis. Vaginal examination shows that there is some softening of the cervix, and that the body of the uterus is enlarged, softened, and rounded. I do not lay much stress on Hegar's sign, which can only be obtained if the abdominal wall is very lax. The increased width of the uterus is a useful aid to diagnosis, particularly as it can be estimated by the vaginal fingers alone where, for one reason or another, bimanual examination is difficult. Thus it is particularly useful in cases of retroflexion. The fornices should be palpated for any abnormality.

Patients rarely pay a visit at this stage of pregnancy, except for confirmation of its existence or for a diagnosis, where the history is unusual. Yet a visit at this time is important ante-natally, for many miscarriages result from retroflexion of the uterus, and at this stage a mobile retroflexion can readily be put right, either by postural exercises or, in severer cases, by the use of a watch-spring pessary.

Twentieth to Twenty-second Weeks.

A stage at which many patients pay a first visit is about the twentieth to the twenty-second week of pregnancy. To the history of amenorrhœa are now added the facts of "quickening" and swelling of the lower abdomen. As regards "quickening," it is usually stated that it occurs between the eighteenth and twentieth weeks of pregnancy, but many patients say that they are conscious of fœtal movement considerably earlier than this. On the other hand, movements of flatus in the intestine can be mistaken for fœtal movement ; patients who have already had several children come for confirmation of the presence of pregnancy, complaining of fœtal movement, when they are not pregnant at all.

On examination at 20 to 22 weeks the breast signs are of great importance in primigravidæ. Occasionally they are not conspicuous. The linea nigra shows in the lower abdomen and a definite median swelling is seen and felt there. External ballottement shows the presence of fœtal parts, and the fœtal heart is sometimes heard with surprising distinctness. Even if the fœtal heart is not heard, fœtal movements can frequently be heard as well as other signs of activity, such as the uterine souffle. At this stage vaginal examination confirms the diagnosis, but is not always necessary for this purpose. There is early congestion of the vaginal mucosa, softening is marked, and the swelling in the abdomen can be proved bimanually to be the uterus. Internal ballottement can be produced in the anterior fornix.

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* A paper read at a meeting of the London Association of the Medical Women's Federation.

Pelvimetry.

Varying with the circumstances of the case, I always consider the size and shape of the pelvis at this, or at an earlier visit, as a guide for the future of the case. It is important to note the stature of the patient. When she lies on her back on the couch, one considers her general outline. A useful "grip" is made by resting the ball of either thumb on the anterior superior spine of the pelvic crest, and clasping the crest in one's hands (Fig. 1). This gives information as to the general size and symmetry of the pelvis; it shows whether the intercristal measurement is greater than the interspinous, and indicates the antero-posterior measurement of the pelvis. One then takes the ordinary measurements, the interspinous, intercristal, and external conjugate.

Internally, I examine the capacity of the pelvis with the patient in Sims's position, judging the width of the pubic arch, sweeping round either side of the pelvis for any abnormality and reaching up towards the promontory. It is difficult to be sure of the promontory unless one can reach slightly beyond it to the beginning of the lumbar curve, and this is only possible when there is contraction of the diagonal conjugate. The resistance of the perineum may play an important part in preventing one from reaching the promontory. Pelvimetry, especially in its wide sense of judgment of the size and shape of the pelvis, is of great importance to the examiner as a guide, but except in extreme cases the crux of the case comes later in the judgment as to whether the particular head in question will pass through the pelvis or not.

First and Second Pelvic Grips.

At 34 to 36 weeks complete ante-natal diagnosis is possible, and I propose going rather fully into the description of a method by which I find students and nurses soon learn to build up a sound diagnosis for themselves.

With the patient's date in mind, first note the general size, shape, and prominence of the abdomen, and also the height of the fundus uteri. The first pelvic (Pawlik's) grip is then made. For this the patient lies extended, breathing freely, and the examiner faces her. The hand is laid above the symphysis, taking the widest possible grip, and as the patient expires each time it is sunk a little deeper into the abdomen (Fig. 2). In favourable cases the hand now finds itself gripping the fœtal head, and it can be determined right away whether this is movable or fixed in the pelvis, and, by manipulating the hand slightly, whether flexion is present. Thus, by this grip alone a complete diagnosis of the lie of the fœtus may be made, and the remaining grips are only confirmatory. If the head is not felt by this grip and the succeeding one, it must be sought elsewhere before an attempt is made to discover other parts of the fœtus.

The second pelvic grip is now taken, facing the patient's feet, with her thighs and knees slightly flexed to relax the abdominal muscles. Again, a wide grip is taken, capable of enclosing the whole head, and the finger tips are sunk downwards and backwards, again with each expiration, until the presenting part is felt between the hands (Fig. 3). This grip is perhaps even more useful than the first, and in most cases confirms it. A head that appeared fixed sometimes shows itself somewhat movable, when the muscular tension is relieved, and occasionally the flexion of the head is found to be towards the opposite side from that expected. This is because the Pawlik grip does not always admit of the palpation of that part of the head which lies posteriorly.

Fundal Grip, &c.

The fundal grip is now practised and is of particular importance when the head has not been found at the pelvic brim, when there is uncertainty as to whether the presenting part is the head or not, or when multiple pregnancy is suspected. It is most important to find the head before proceeding further with the diagnosis. If the head is at the fundus its main bulk rests to one side or other of the middle line and two grips are taken accordingly, the hands being placed sufficiently widely apart to allow of the enclosure of the whole head (Fig. 4). I impress the importance of width of grip because I find that beginners rarely make it wide enough. The deciding points about the head are its firmness and roundness, the fact that it ballottes between the examining hands, and that it is divided from the rest of the body by a definite gap. Ballottement of the head at the fundus can also be obtained by laying one hand over the prominence produced by it and shaking it within the convexity of the hand. The breech never moves sufficiently to give this result.

To decide where the fœtal back lies, a useful grip is one by which the resistance of the two sides of the lower abdomen is compared. The fingers of one hand are spread between the anterior superior spine and the umbilicus and sunk deeply into the abdomen (Fig. 5). The same hand is used in exactly the same way on the other side. This shows at once whether the back is anterior or not, and by the definite resistance of one side on which side it is. Confirmation is obtained by holding the uterus in position with one hand while palpating with the other, and vice versa. The fœtal heart is now sought according to the diagnosis made and used as a confirmatory sign of diagnosis.

Engagement of the Head in the Pelvis.

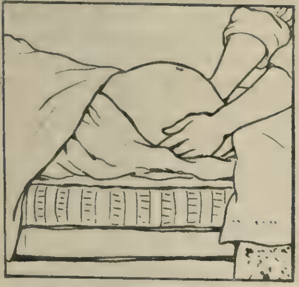
It used to be taught that in primigravidæ the head did not begin to engage until the thirty-sixth week of pregnancy, and then gradually sank down into the pelvis, and that in multigravidæ engagement did not occur until labour began or shortly before this. We must consider what produces engagement of the head and what determines a difference between primi- and multigravidæ.

As pregnancy advances stretching of the uterine and abdominal walls increases, and, given a normal pelvis and fœtal head, the tension produced thereby overcomes the resistance offered by the pelvis and the structures in it, and the presenting part engages in the pelvis. The tension is greater in primigravidæ because neither the uterus nor the abdominal wall has been stretched before; hence the fœtal head usually engages early, but in multigravidæ with well-preserved musculature engagement occurs also. Usually engagement has begun at 34 weeks. Occasionally we find a head quite deep in the pelvis at 28 to 30 weeks. If the head has not engaged, or does not show signs of engaging, by 36 weeks in a primigravida the reason must be carefully sought. If the pelvis is small or asymmetrical the fact is already known. The head may be large or in a bad position; a loaded rectum will push the head out of the pelvis, and a low-lying placenta acts in the same way. The grip I now use to the exclusion of others to determine whether a head is likely to go through a given pelvis or not, is one by which I press down the fœtus towards the pelvic brim from the fundus, when the abdomen is lax, and lay the other hand flat just above the symphysis (Fig. 6). Having made a careful diagnosis of the presentation and position of the head previously, I then judge by the amount of overlapping present.

Maturity of the Fœtus.

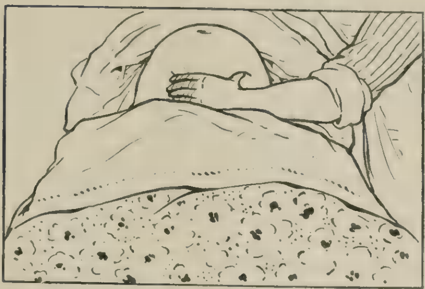
It is important to be able to give a sound opinion on the maturity of the fœtus for two reasons: first to be able to give advice to those who require it, as for instance, to a mother who has conceived during the amenorrhœa of lactation; and, secondly, to determine whether the patient's dates are reliable. The question of maturity can be decided only as a judgment on the average find, since normal full-term infants vary so considerably in size, and such signs as deep engagement the head may be altogether misleading. First note e height of the fundus uteri and the general size of e abdominal swelling; then, if the fœtus is suffi- ently mature, note the size of the head and its sition as regards the pelvis—whether floating above e brim, engaging at the brim, or deep in the pelvis. Until the uterus reaches the umbilical level at about weeks the height of the fundus is a fairly good uide; after this all the points above must be taken to consideration together. I rely most on the size the fœtal head, and, gripping this with one hand d the breech with the other, consider the size of the ild. It is well in multigravidæ to find out the weight former children at birth.

FIG. 1.



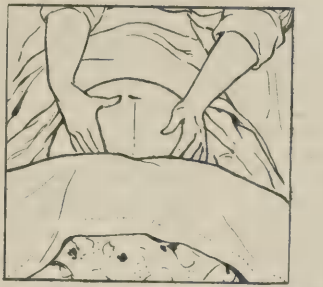
Ball of either thumb on anterior superior spine of pelvic crest, the crests being clasped in the hands.

FIG. 2.



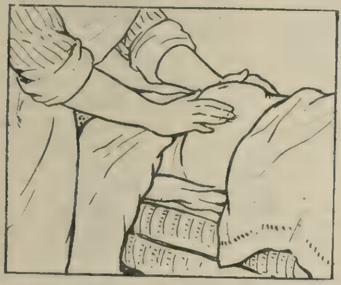
First pelvic (Pawlik's) grip; hand above symphysis pubis, as widely extended as possible, to grip the fœtal head.

FIG. 3.



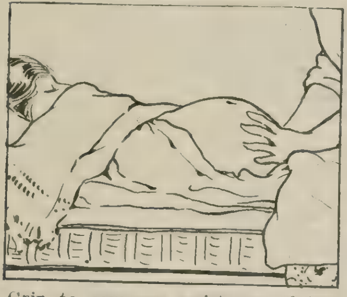
Second pelvic grip. The position of the hands indicates flexion of the head towards the right side.

FIG. 4.



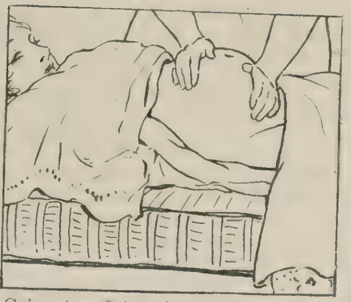
Fundal grip; width of grip is important.

FIG. 5.



Grip to compare resistance of two sides of lower abdomen.

FIG. 6.



Grip to determine likelihood of passage of fœtal head through pelvis.

When testing the size of the abdominal swelling d that of the fœtus as compared with the patient's es, one's attention is drawn to a number of abnor- lities, and to the question of multiple pregnancy. for instance, we find an abdomen abnormally large the date, with a head of medium or small propor- ns, it often pays to search for a second head.

Presentation and Position of the Fœtus.

n the early stages of pregnancy the position is stable. At 28 to 30 weeks breech presentations are mon. Spontaneous version is still liable to occur ween 32 and 34 weeks, but after this it is rare. It nteresting to note how often there is change of ition in vertex presentations late in pregnancy en the fœtus appears to have settled down to its l position. I have noticed this often, and recently mined a patient at weekly intervals four times ning, shortly before delivery, and found L.O.A. l R.O.A. alternatively. The fœtus also quite often es up positions that do not come into the usual ssification.

Vith regard to the turning of breech presentations, o not attempt external version until about the ty-fourth week, since there is still likelihood of its urring spontaneously. If left later than this date re is often difficulty in performing version on ount of the size of the child—the head gets under costal margin, the breech is engaged in the pelvis, it is difficult to obtain a grip upon it. In performing version, if the breech is engaged, the patient must rest in the Trendelenburg position until it is disengaged. The head is taken in one hand, the breech in the other, and it is just as important to push the breech up as to draw the head down. No actual force should be used and the manipulation ought not to hurt the patient. If version does not occur with comparative ease, I allow the presentation to persist in normal multigravidæ and in primigravidæ with well-shaped and good-sized pelves. Death of the fœtus or accidental hæmorrhage may occur after version, and the risk of breech delivery in these cases is not great. In primigravidæ with small or even medium-sized pelves version should be performed under an anæsthetic if necessary. An extended breech will rarely turn, since the legs act as splints preventing flexion of the body.

The Fœtal Heart.

In listening for the fœtal heart, it is always wise to take the patient's pulse also. Rapidity of her heart action may be produced through nervousness, and confusion between the two is possible. A monaural stethoscope with a wide base for collecting sound is the most satisfactory instrument for all-round use. Until about the twenty-second week the fœtal heart is often inaudible. Occasionally it is surprisingly distinct, depending largely on the nearness of the fœtal back to the abdominal wall. Until 26 to 28 weeks, when the position of the child begins to stabilise, it is best to listen for the heart over the uterus in the middle line and, if it is not heard there, over some solid part of the fœtus determined by palpation. After the child has adopted a stable position, in all presentations when the back is anterior, the heart is heard best over that part of the back nearest to the heart. It is according to this known position, determined already by palpation, that it should be sought and its intensity compared with that in other positions in cases of doubtful diagnosis. In a vertex presentation with engaged head, the point of maximum intensity is roughly on a line drawn from the umbilicus to the anterior superior spine of the pelvic crest; if the head floats freely above the pelvis it is higher than this. In breech presentations the point of maximum intensity is rarely above the umbilicus—the head is above the umbilical level, the back below it. Only in those cases where the child's head is under the costal margin—i.e., towards full term with a large child—does one hear it best at the umbilical level or above it. In posterior positions the heart sounds are conducted indirectly, and may not be best heard at the point nearest the heart.

DIAPLYTE TUBERCULIN.

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THE arrival among us of a new tuberculin—for Dreyer's antigen is no less than this, though we may hope it will prove more—again brings into prominence the important subject of dosage and administration of these substances, powerful for harm as well as good, and necessarily given at the start in doses almost immeasurably small. Tuberculin, especially in the treatment of pulmonary tuberculosis, has fallen into practical disuse in this country during the past ten years, and I find but few of the younger physicians among us have had experience of its administration. Our pathologists, moreover, though well versed in the small infrequent dosage suitable to the treatment of localised tuberculosis, have for the most part ignored the method of frequent and rising dosage accepted all the world over as applicable to the treatment of pulmonary and other forms of autotoxic tuberculosis. Under these circumstances I am tempted to restate some of the essentials of safe administration under the latter method, especially with a view to the avoidance of unexpected large reactions which may vitiate the success of the method and imperil the recovery of the patient. I shall speak only of dosage and of method of administration.

Preparation of Antigen.

The preparation of the antigen for injection demands (1) a diluent, in this case sterilised normal saline containing 0·15 per cent. formalin; (2) an accurate tuberculin syringe graduated in 1/10, the barrel for accuracy being about 8 cm. long (syringes of the Record type are the best); (3) a long 10 c.cm. graduated measure or pipette; and (4) some 10 c.cm. stoppered bottles. 1 c.cm. of the "original solution" (in this case Dreyer's antigen) with 9 c.cm. of the diluent now makes dilution 1, whose bottle is so numbered; 1 c.cm. out of this bottle (dil. 1) with 9 c.cm. of diluent now forms dil. 2; and 1 c.cm. of dil. 2 with 9 c.cm. of diluent makes dil. 3, and so on, each dilution being 1/10 strength of the one above. Now it is obvious that 1 c.cm. of dil. 1=0·1 c.cm., 1 c.cm. of dil. 2=0·01 c.cm., and 1 c.cm. of dil. 3=0·001 c.cm. of "original solution," and so on. This is to state the dose in fluid measure, which is now always done for convenience, and also for avoidance of misunderstanding (since Koch often spoke of milligrammes when he meant cubic millimetres, and, moreover, discussion arose as to the solid contents of T.R., which was made from 10 mg. of tubercle bacilli per c.cm., but found to contain whenever completed only 2 mg. of solid substance (Wright; Ruppel)). If it is demanded, for Dreyer's antigen, that a dose be stated in mg. of solid substance, then this is easily arrived at by dividing the dose in c.cm. by 5 (since 1 c.cm. contains 0·2 mg. of antigen). Thus 1 c.cm. of dil. 3 contains 0·001 c.cm. of original solution, or 0·0002 mg. of solid antigen, and 1 division (1/10 c.cm.) of syringe 1/10 of this, or 0·000 02 mg.

Now when we come to the matter of initial dosage we find that Dreyer's antigen is weaker than any of the tuberculins in common use—it may, perhaps, for convenience be considered to be 1/10 strength of T.R., the weakest of the older tuberculins whose initial dose could be safely put at 0·001 c.mm., or 0·000 001 c.cm.—i.e., 1 division (1/10 c.cm.) of dil. 5. With Dreyer's antigen it should be safe, even in febrile cases, to commence with a dose 10 times this strength—i.e., 1 division (1/10 c.cm.) of dil. 4. In afebrile cases a dose of 2½ or 5 divisions (¼ or ½ c.cm.) of dil. 4 should be safe, this latter representing 1/100 000 mg. of the solid antigen.

Dosage.

So much for dose nomenclature, which need, fortunately, no more be bothered with once the initial dose is decided on. After that the dosage runs up in divisions of the 1 c.cm. syringe from one diluent to the next, from dil. 4 to dil. 3, to dil. 2, and so on. It is, in especial, of the method of graduating this rising dosage that I wish most emphatically to speak. It is here that danger to the patient arises, since avoidance of unexpected reactions (I shall say nothing here of reactions deliberately forced!) depends very closely on the smoothness of this upward gradient of dosage. Now it is obvious that if we rise in divisions of the syringe 1, 2, 3, 4, 5, 6, 7, 8, 9, that is in arithmetic progression, that the rise from 1 to 2 is doubling while the rise from 8 to 9 is but an increase of 1/8—the rise 1 to 2 is a "cliff" in dosage at which a "reaction" is likely to occur. Tuberculin administrators have got over this difficulty by making such a sequence as 1, 1·5, 2, 3, 5, 7, 10, 15, &c., but this is, after all, but a rough and ready device which meets the need but partially. It does not really do away with "cliffs," and it condemns us to a rapidity of rise which may not suit the particular case under treatment. We require, not only a smooth rise, but a rise whose steepness we can modify to meet the individual case. The only logical way to achieve these two ends is by the use of a table where doses rise in geometrical progression, always by the same multiple, however small, and where many different gradients are provided to choose from. Such a table was prepared for Lawrason Brown in the past, and a modification of it, made by Egbert Morland for a book on Tuberculin Treatment in which he and I collaborated,[1] is here in part reproduced. In this table the numbers refer to divisions of the 1 c.cm. tuberculin syringe (which must be divided in 1/10). Since no more than 1 c.cm. can be given with this syringe no mistake can be made with these numbers, and the decimal point may be put in or omitted as desired. Having ascended a column of dosage on one dilution, we pass to the next stronger dilution and work up it on the same basis, 1 division (1/10 c.cm.) of the new, stronger dilution being equal to 1 c.cm. of that we are leaving.

10·0	10·0	10·0	10·0	10·0	10·0	10·0	10·0
4·6	5·6	6·3	6·8	7·5	7·9	8·3	8·6
2·2	3·2	4·0	4·6	5·6	6·3	6·8	7·4
	1·8	2·5	3·2	4·2	5·0	5·6	6·5
		1·6	2·2	3·2	4·0	4·6	5·4
			1·5	2·4	3·2	3·8	4·65
				1·8	2·5	3·2	4·0
				1·3	2·0	2·65	3·4
					1·6	2·2	2·9
					1·3	1·8	2·5
						1·5	2·15
						1·2	1·85
							1·6
							1·4
							1·2
1·0	1·0	1·0	1·0	1·0	1·0	1·0	1·0
3	4	5	6	8	10	12	15

With such a table the initial dose, generally much below the patient's reaction point, may be rapidly pushed up, on a basis of 3 or 4 doses to each dilution or by doubling (a convenient plan), till it begins to be ffective, and thereafter a basis of, say, 10 or 12 doses) each dilution (see Table [10] and [12]) may be sed to continue the treatment. In recording the osage it is convenient to put the "dilution" as a umber in a circle, and the "basis" of dosage—i.e., s gradient—as a number in a square. Thus at a lance the whole dosage and method are made apparent. or instance, starting with 2·5 divisions of the yringe in dil. 4, the doses might read as follows: 4) 2·5, (4) 5, (4) 10 (or (3) 1 which is the same), 3) 2, (3) 4. At this point, up to which we have oubled, let us suppose evidence of "reaction," that , that the dose has now become "effective." Now e need to get on to a slower "basis," let us say 10], and we continue (3) 5, (3) 6·3, (3) 7·9, (3) 10, 2) 1·3, (2) 1·6, &c.

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[1] Tuberculin Treatment. London: Oxford Medical Publications. Second edition. 1913.

Of the means whereby control of dosage is attained, nat is reactions and "subreactions," I shall not peak here, except to remark that it seems likely local reactions" will play small part in control of losage by Dreyer's antigen, and that hence we nust be all the more watchful for slight effects on emperature (both down and up) and on general ymptoms, as indications that the "threshold of esponse" is reached, and a more sloping gradient f dosage indicated.

If much of the foregoing seems elementary and bvious may I plead first the supreme importance to ır patients that it should be understood by all; econdly, the extraordinary ease with which mistakes in tuberculin dosage may be, and have been, nade; and, thirdly, the importance that any "new a" should escape disaster at the outset. If this ommunication is the means of spreading the use of geometrical dosage" I feel that it will have served useful purpose.

HREE CASES OF BILATERAL RENAL CALCULUS.

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THE following cases illustrate some important oints in the diagnosis and treatment of bilateral nal calculi.

CASE 1.—Female, aged 31, was admitted to the Norfolk nd Norwich Hospital on August 9th, 1921, complaining of ain in right side of abdomen.

History.—The patient stated that during the last six years e had suffered with occasional attacks of pain in the right de of the abdomen, the pain radiating into the right loin. ne attacks of pain varied in severity, but on five or six casions she was confined to bed for about a week. The vere attacks were followed by the passage of small stones ith the urine; and on five or six occasions she had passed least 12 stones during each attack. She had never, so far she knew, passed any blood in the urine. On August 5th, eling quite well, she went to the seaside; on the 6th she as seized with a very severe pain in the right side of the domen. The urine was thick and she passed it frequently th severe pain. On the 7th she returned home and was lmitted to hospital on the 9th.

Condition on Admission.—The patient is a pale, ill-urished weakly-looking woman. Temperature 100° F., lse 98, respirations 24. Eyes: pupils equal reaction to ht and accommodation; tongue furred. Chest: thin, oves well and equally; lungs normal. Heart: apex beat th space inside nipple line; sounds normal. Abdomen: not stended; abdominal wall thin and lax. A swelling, seen scending below the right costal margin, moved on respiration. The swelling was easily palpated; it had well-defined argins, did not cross the middle line, was easily pushed ck into the loin; its manipulation caused much pain. ne swelling was resonant. Several hard bodies like renal lculi could be felt; on manipulation a sensation of crepitus as also felt. Left kidney not palpable or painful.

Urine, specific gravity 1012, alkaline, no blood or casts; bumin, a trace. There was a sediment on standing and e urine contained a large quantity of pus. Re-examination: lvis of right kidney contained many calculi. There were o stones in the left kidney.

The patient, after a week's treatment, considerably proved; the temperature fell to normal, and the amount pus in the urine considerably decreased.

Operation.—Right pyelo-lithotomy and removal of 23 calculi on August 15th. Under chloroform and ether the kidney was exposed by a right lumbar incision, 5 inches in length, separated from the surrounding perinephric tissue, and delivered through the incision without difficulty. The pelvis of the kidney was much dilated; it was incised and three large and 20 small calculi were removed. They were faceted and irregular in shape, the three large ones having a deposit of phosphates upon them. The total weight of the 23 was [illegible] oz. A considerable part of the kidney tissue had been destroyed, but a fair amount of secreting tissue remained. A catheter was passed through the pelvis of the kidney and so into the ureter and bladder. There was no obstruction, the catheter was removed, and the incision in the pelvis closed. The lumbar incision was closed, with drainage. The patient made a good recovery. The lumbar wound healed in four weeks, and the patient was sent to a convalescent home.

Second Admission to Hospital.—The patient was again admitted on Dec. 3rd, 1921. Her general condition had much improved; she had increased in weight and had no pain since her discharge from hospital. On examination, the right kidney was only just palpable; no pain in right loin. Urine: Specific gravity 1010, acid; albumin, a trace; small amount of pus still present. X ray examination: no stone now present in right kidney; two stones in left kidney.

Operation.—On the 6th, left lumbar nephrolithotomy, two stones were removed; they were similar in substance to those removed from the right kidney, and weighed ½ oz. together. The wound was closed with drainage, and the patient made a good recovery from the operation, the wound being quite healed three weeks after the operation.

CASE 2.—Male, aged 36, admitted to the Norfolk and Norwich Hospital on August 7th, 1921, complaining of dull aching pain in both loins.

History.—Patient stated that in 1914 he began to notice dull aching pain in both loins. In October of that year he was admitted to a Naval Hospital after passing a small quantity of blood in the urine. He was X rayed, and calculi were found in both kidneys. He was discharged from the Service without operation. During the past five years he had suffered with occasional attacks of pain in the loins. The attacks of pain had got more frequent of late and he had never felt quite well.

Condition on Admission.—The patient was a healthy-looking, well-developed man. Temperature 98° F., pulse 80, respirations 18. Eyes reacted to light and accommodation, Cranial nerves normal, tongue clean, tonsils not enlarged, no palpable lympathic glands in neck. Chest: heart and lungs normal. Abdomen: abdominal wall muscular and well developed, moved well and equally on respiration, abdomen not distended. There is tenderness on palpation over both kidneys, especially the left, the lower pole of which is palpable. The liver is not enlarged, no tenderness over the appendix. Upper and lower extremities normal. Urine: quantity, two pints in 24 hours; reaction acid; specific gravity, 1014; albumin, a trace. No blood. A few pus cells present on microscopic examination. X ray examination: A large stone in pelvis of right kidney, a small stone in pelvis of left kidney. Cystoscopic examination: urine could be seen coming from the right ureteral orifice, but none from the left. It was concluded that the upper end of the left ureter was blocked by a stone. Operation advised.

Operation.—On August 22nd a left pyelo-lithotomy. Left kidney exposed through a left lumbar incision, separated from the surrounding tissues and drawn out of the wound; a calculus could be felt in the pelvis of the kidney and upper part of the ureter. The kidney was turned forwards and upwards so as to expose the posterior aspect of the pelvis. An incision was made into the posterior aspect and a stone extracted without difficulty. The ureter was then explored by passing a catheter from its exposed upper end into the bladder. There was no obstruction. The incision in the pelvis was then sutured, and the kidney returned into its bed. The lumbar wound was closed with drainage. The wound healed in the course of three weeks and there was no discharge of urine from the loin. The patient was discharged from hospital a month after operation.

Second Admission to Hospital.—The patient was again admitted in October, 1921; on Oct. 30th, the right kidney was explored and two large stones were removed from the pelvis and cortex of kidney. The ureter was examined and no obstruction was found; the wound was closed with drainage and the patient made a good recovery. The stones consisted of phosphates. Two branched, faceted stones were removed from the right kidney, together weighing 1¼ oz. One beak-shaped stone removed from the left kidney and ureter, weight ¼ oz.

CASE 3.—A male, aged 46, a sailor, was admitted to hospital on Oct. 10th, 1918, complaining of pain in left loin and occasional passage of blood with the urine.

History.—The patient stated that in 1902 a stone was removed from the left kidney. He remained in good health until about 1917, when he began to suffer with attacks of pain in the left loin, the pain being referred to the groin. After a severe attack of pain he would occasionally pass a little blood in the urine. He served in the Navy from 1914 until October, 1918, when he was admitted to hospital.

Condition on Admission.—A fairly healthy-looking man. Temperature 98° F., pulse 88, respirations 20. Cranial nerve normal, tongue clean, heart and lungs normal. Abdomen: moved well and equally on respiration, no distension, tenderness on palpation over both loins, but the kidneys could not be felt; liver not enlarged; a scar in the left loin, the result of a previous operation. Urine: specific gravity 1016, acid; no albumin, no sugar, On microscopic examination a few red blood cells present. X ray examination: A stone in each kidney.

Operations.—On Nov. 14th left lumbar pyelo-lithotomy was performed and a large, single, flattened stone removed from the pelvis of left kidney. The pelvis was sutured and the wound closed with drainage. There was no escape of urine through the loin, and the wound healed by primary union. On Jan. 9th a similar operation was performed on the right side and a single stone was removed from the pelvis of the right kidney. The patient made an excellent recovery from the operation. An X ray examination was made after the operation and no sign of stones was to be seen; but stones recurred in both kidneys and the latter were again explored in 1920, stones being removed from the pelvis of each kidney. The patient made a good recovery after each operation.

Remarks.

Sir John Bland-Sutton in his recent selected essays remarks, "The fate of patients who have stones removed from one or both kidneys is an important matter, and one on which little has been written." Among points for consideration in cases of bilateral renal calculi perhaps the most important are: (1) Do the symptoms and physical signs indicate operative treatment? (2) If operative treatment is indicated shall both kidneys be operated upon at the same time or shall one be operated upon before the other? (3) By what method shall the calculi be removed from the kidney? Operative treatment must not be considered necessary simply because X ray investigation shows calculi in the kidneys; the position of the calculi, their size and shape, the symptoms and physical signs to which they give rise, should all be taken into consideration. The three cases described illustrate some interesting features of the disease. Renal calculus may be one of the most chronic surgical diseases, but complications such as renal colic, infection of the urinary tract, and calculous anuria—the gravest and most fatal of all urinary calamities—may occur at any time and almost without warning. Although the ordinary text-books on surgery do not seem to urge operations on cases of bilateral renal calculi, it would seem well to perform it as early as possible in suitable cases where complications seem likely to occur to prevent excessive damage to the kidney taking place from the pressure of the stone, and to prevent the possibility of calculous anuria. The operation, if done at the proper time and in the proper way to avoid complication, and not because of their development, should have a very low mortality.

When operative treatment is indicated, most surgeons consider it best to operate on one kidney at a time, allowing a reasonable interval to elapse before the other operation, but some have advocated operating on both kidneys at the same time; if, however, the only reason for operating on both kidneys at one time is the desire to avoid a second operation, it does not seem to me to be sufficient. When the kidney has been exposed, the importance of determining the correct procedure for the investigation of the kidney and for the relief of the condition present cannot be over-estimated. Sometimes it is not easy to locate the stone; in such a case it is always wise only to do nephrolithotomy or splitting of the kidney as a last resort. This procedure is rarely necessary. Nearly all stones can be located and removed by the performance of pyelotomy and pyelolithotomy combined with the operation that may be described as restricted nephrolithotomy—that is, the making of a small incision through the cortex of the kidney and removing a stone through this small incision. In some complicated cases it may be necessary to remove the kidney.

The length of time during which patients may suffer from renal calculus is noteworthy; in these three cases the condition had in every case been present for more than five years, and in one case over 20 years. In this, as in other surgical diseases, it is often the complications that bring the patient under observation. The disease itself may be present for a considerable time without causing any symptoms.

In bilateral renal calculus it would seem that it is common for the patient to refer the symptoms to the side only, and it would often be impossible to make a diagnosis without the assistance of the X ray. Each case illustrates the importance of X raying the entire urinary tract when a stone has been found in any part of it. It has been recorded that the first successful skiagram of renal calculus was taken by J. McIntyre, of Glasgow, in 1896. When it is realised that 50 per cent. of the patients sent to the radiographer with the diagnosis ? renal calculus are returned as negative, it at once becomes apparent what an important factor the X ray has in the diagnosis. It is almost impossible to diagnose bilateral stone without the aid of X ray. The cystoscope is of additional use in deciding on which kidney to operate, and gives definite information as to the obstruction to the ureter. It is uncommon to be able to palpate renal stones, but in one of the cases recorded this could be done without any difficulty. Similar cases have been recorded by Pick and Morris.

Bilateral renal calculi are not uncommon, but not many records of the treatment of such cases are to be found in the literature. Kummel, in 101 consecutive cases of renal calculi, found both kidneys involved in 16 cases. Bevan states that the proportion of bilateral cases numbers about 20 per cent. Küster, in 764 cases of stone, found 90 bilateral; he collected 20 cases in which double operations were performed, and found ten successful cases, three recovered with fistula, and seven died, the deaths being due in most cases to uræmia. Simpson, of Liverpool, has recorded an interesting case of bilateral nephrolithotomy for multiple calculi in a boy aged 8; in his paper he mentions some details of the history of the operation for removal of stones from the kidney. He records that the operation is said to have been performed in the time of Hippocrates, but not again for many centuries after that time. In 1579 it is recorded that Paré operated upon an archer reprieved from death, but it is not stated that the stone was removed.

In 1696 Marchette, of Padua, is said to have extracted a stone from the right kidney of the English consul at Vienna, and in 1773 Paul, of Stroud, is believed to have removed a stone from the back of a woman and effected a cure. The discovery of anæsthetic and antiseptic soon made the removal of stones from the kidney an operation which might be undertaken with some hope of success. In 1869 Thomas Smith described the operation and Dawson, of Ohio, tried it in 1872, but the patient died. At St. Bartholomew's Hospital Callender, in 1873, and Morrant Baker, in 1874, attempted the operation, but both patients died. In 1876 Savory, guided by a sinus, tried it again and cured his patient. In 1878 Teale operated upon an unsuccessful case, and in 1880 Morris successfully recovered a stone from the kidney. From that time onwards the operations on the kidney have been numerous and successful.

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DUODENAL DIVERTICULA.

WITH REPORT OF A CASE OF GANGRENOUS DIVERTICULITIS.

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HISTORICALLY our knowledge of duodenal diver- cula can be divided into three stages. (*a*) A long eriod of just over 200 years from 1710 to 1912; uring this period these pouches were recognised as eing occasionally present, and gradually their acroscopic and microscopic appearances were escribed. (*b*) A short period from 1912 to 1922; in hese ten years it was shown that the condition could ometimes be discovered in the living subject by means of the X rays. (*c*) The third stage—that of the escription of pathological conditions of these pouches nd the resulting symptoms; this has largely followed n and depended upon the work of the radiologist.

In 1710 Chomel[1] discovered post mortem in the ody of a female, aged 80, who had died of apoplexy, pouch connected with the duodenum, which con- ained 22 stones of a yellow-white colour, with olished surfaces and solid but not stony hard con- stency. He then described the symptoms from which he suffered: "La dame qui portoit ces pierres ne omissoit point; mais deux heures après qu'elle avoit mangé elle sentoit une legere douleur vers l'endroit ù le sac étoit placé. C'étoit-la justement le temps où chile de la nouvelle digestion couloit dans le uodénum, qui ne lui donnoit pas un passage assés bre, parcequ'il étoit comprimé et gesné par le sac." rom this description it is doubtful whether the ouch would correspond with an ordinary duodenal iverticulum.

In 1761 followed Morgagni's[2] description, "in the ody of an apoplectic man—a diverticulum connected ith the duodenum about 2 inches below the pylorus, hich was a kind of cellule not very protuberating, but ig enough to admit a finger, with no trace of present r past ulceration." The first description in this ountry was by Habershon[3] in 1857, who said, diverticula have been noticed but are exceedingly are as compared with those arising from the lower art of the ileum; these pouches in the duodenum onsist generally of mucous membrane and might be onsidered as a form of hernial protrusion of that embrane." From this time onwards pouches were escribed by various authors, and in 1893 Perry and haw[4] discussed 14 cases, dividing the pouches into two ypes—(i.) those in which the surrounding intestine as apparently normal, and (ii.) those in which the ouch was the result of ulceration or traction. They so discussed the age incidence, sex, site, and the ct that the pouches are occasionally multiple. eith also in 1903 and 1910[13] increased our knowledge this subject. The result of these various descrip- ons was that in 1911 Buschi of Bologna[5] was able to ummarise 54 cases.

In 1912 Bauer[6] mentioned a case in which a pouch as thought to have caused pyloric obstruction; perative treatment (gastro-jejunostomy) was carried ut, but the patient died on the eleventh day. The rst pouch said to have been removed surgically was ported in 1914 by Forssell and Key, quoted by ase,[17] in a female of 41; the condition was discovered y means of X rays and removal yielded a cure of ersistent digestive complaints. In 1917 Ritchie and cWhorter[7] found 76 cases in the literature with 97 verticula, together with 11 cases with 12 diverticula ublished by radiologists. The radiological aspect as developed largely by Cole, Case,[17] and in this ountry by Spriggs.[8]

Causation.

There has been much discussion as to the manner in hich these pouches are produced, and various heories have been advanced. The following ætio- gical factors have to be considered: (1) Whether these diverticula are congenital or acquired; (2) if acquired, whether of the traction or pressure type.

- Diverticula
  - Congenital (true)*
  - Acquired (usually false)
    - Traction
    - Pressure
      - Weakness of wall.
      - Pressure within.

* i.e., composed of all layers of the bowel wall.

It will be seen from the following that these duodenal diverticula are of various types, into whose formation the above factors enter.

Congenital Diverticula.

Many observers regard duodenal diverticula as being of congenital origin, and have advanced the following points to support this theory:—

(1) The duodenum gives off the pancreatic and biliary buds and so is regarded as being a likely site from which, owing to excessive activity, other similar buds might be extruded; but it is to be noted that diverticula are also common in the colon, especially the lower colon, where there are no such organs as the liver and pancreas developed, whereas in the region of the cæcum and ascending colon, where there is a bud (the appendix), these diverticula are rare.

(2) The presence of portions of pancreatic tissue in the wall. This, however, could be accounted for otherwise, as the presence of such islands of pancreas in the muscular wall of the duodenum would leave a weak area from which during life a pouch might be developed.

(3) The absence in the majority of cases of any pathological condition—e.g., ulcers, adhesions, &c. This is certainly the case, but a pathological condition is by no means essential to the production of a pressure pouch.

(4) A case of Shaw's[9] in which, in association with atresia of the duodenum, there was a congenital sac. This shows the undoubted possibility of these pouches being congenital in origin, but here there was atresia of the duodenum, and so the condition was far from representative; moreover, the pouch was shallow and arose from the first part of the duodenum, a rare position.

(5) Buschi[5] observes that on account of the fluid nature of the duodenal contents the stasis would have to be of a high grade to produce pouches. It would seem, however, that the pressure exerted by fluid, even if slight, might start a pouch at some weak site, and once formed the condition would be progressive.

(6) In Ritchie and McWhorter's case[7] the history goes back to childhood and so suggests a congenital origin. This does not appear to be a very forcible argument, as a history of digestive disturbance cannot be definitely assigned to the presence of such a pouch.

(7) The presence of associated abnormalities—e.g., œsophageal pouches, bladder pouches, &c.

(8) Lewis and Thyng[10] showed the presence of intestinal diverticula in embryos of the pig, rabbit, and man.

(9) The fact that the diverticulum may be composed of all layers of the normal duodenum. This is, however, uncommon—an example is afforded by a case recorded by Murchison[11] and the case is reported below.

The conclusion may then be drawn that congenital pouches may occur, but they probably only form a small percentage of duodenal diverticula. Evidence in favour of an acquired origin of these pouches is as follows:—

(*a*) Anatomically, the pouches usually arise from weak areas of the wall—e.g., the retro-peritoneal aspect, and where the musculature is weakened by the passage of the pancreatic and biliary ducts or by blood vessels. In a case reported by Dorrance[12] the opening was situated 3·5 cm. below the papilla, but in this case there was a large artery and vein situated in the wall.

(*b*) Histologically, as will be shown below, in the majority of cases reported the structure of the wall was that of a false diverticulum—i.e., not composed of all layers of the duodenal wall.

(*c*) Clinically and radiologically, these pouches have usually been discovered in old subjects, and very rarely described in the young.

(*d*) Experimentally, it has been found that if produced artificially the rupture occurred regularly in the retro-peritoneal aspect. Too much weight cannot, however, be attributed to this, as other workers have failed to confirm this observation.

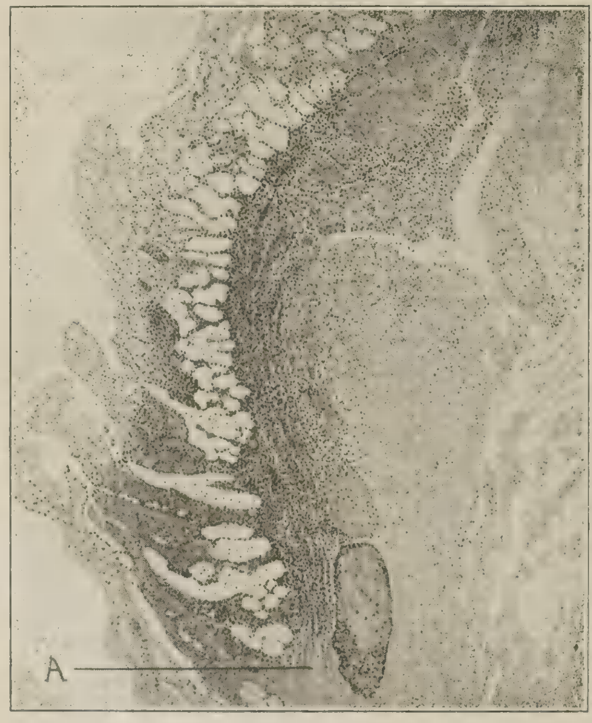
(*e*) By analogy, colonic diverticula arise at the site of penetration of the muscular coat by blood vessels.

(*f*) Some are definitely of an acquired origin and due to traction, but these form a small proportion. The traction may be due to adhesions from gall-bladder disease, or, some authors say, to an atrophic pancreatitis; more probably, however, in this latter case the pancreatitis is secondary to the presence of the diverticulum. It is improbable that the pancreas causes traction pouches, because (1) there are many cases of pancreatitis without diverticula, (2) the pouches are usually easily separated from the pancreas. Keith[13] says traction pouches may be produced in association with visceroptosis, by a prolapsed condition of the duodenum resulting in dragging by the common bile duct.

In the London Hospital in March, 1922, a case under the care of, and operated upon by, Mr. A. J. Walton afforded rather an unusual example of a traction pouch, occurring, however, in the first part of the duodenum.

A married woman, aged 38, admitted on March 6th, 1922. The pre-operative diagnosis was lesser curve ulcer—pyloric obstruction, visceroptosis. On the 7th a barium meal examination was made by Dr. M. H. Jupe, who reported "Bilocular stomach with penetrating ulcer of the lesser curve; gastroptosis and a peculiar condition of the duodenum, so that it appeared to pass transversely to the left to the region of the ulcer." Operation was performed on the 8th: partial gastrectomy, removal of first stage duodenum, appendicectomy. There was an ulcer of the lesser curve adherent to the pancreas and with hour-glass constriction of the stomach; in the duodenum there was a pouch, [illegible] in. × 1½ in., adherent to the lesser curve ulcer.

Fig. 1.—*Section of Apex of Inflamed True Diverticulum of Duodenum (case reported below).*



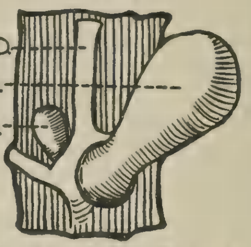
Shows partly necrosed mucosa and submucosa. That the diverticulum is true is shown by the presence of remnants of the muscular coat close to Brunner's glands at the point marked A. The muscularis mucosæ, which should lie superficial to Brunner's glands, cannot be recognised. There is great congestion of vessels and hæmorrhage with acute inflammatory infiltration.

Description of Pouches.

Duodenal pouches may arise from any of the three portions into which the duodenum is anatomically divided. The great majority are found in the second portion of this segment of the intestine and particularly on the postero-internal aspect, in close relation to the ampulla of Vater, so that diverticula at this particular site have been termed by the French "diverticules périvatériens" (Letulle). Spriggs[8] analysed the position of the neck of the sac in 57 cases and obtained the following figures: First part, 11; second part, 41; third part, 3; first and second parts, 2. This, however, probably gives rather a high proportion for those situated in the first part, as he quotes his own ten cases, none of which were in the first part; also Ritchie and McWhorter[7] in their 97 diverticula found only eight in the first stage.

From its duodenal origin the pouch may extend in any direction, but by far the most common is inwards towards the concavity of the duodenum, where it comes into close relationship with the pancreas, from which, however, as a rule it separates readily. Extending in this direction and originating in the region of the ampulla the diverticulum must of necessity be intimately related to the bile duct, which, as a rule, lies on the posterior or lateral wall, but the pouch may be actually constricted or rendered bifid by the common bile duct (Fig. 2); occasionally the bile passage opens on the fundus of the sac.

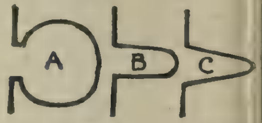
Fig. 2.



Relationship of diverticula to common bile duct (after Sir A. Keith.)

C.B.D. = Common bile duct.
R.D. = Right diverticulum.
L.D. = Left diverticulum.

Fig. 3.



Shapes of diverticula.

A, Flask-shaped. B, Cylindrical. C, Conical.

In size there is considerable variation, ranging from the size of a pea to that of a hen's egg, but most commonly of an intermediate size, about that of a walnut. At its duodenal opening the mouth of the pouch is usually comparatively wide and will usually admit the little finger, and may be still wider; from this origin the pouch extends outwards and may be flask shaped, cylindrical, or conical (Fig. 3).

The sac may be empty, and when exposed at operation becomes distended with gas. Instead of being empty, however, it may contain clear mucoid fluid, chyme, and (rarely) biliary sediment and bile-stained fluid, as in a post-mortem example recorded by Bassett,[14] in which the bile papilla opened at the lower lateral edge of the aperture of the pouch.

In structure the wall is thin; on microscopic examination, if the pouch is of the true type, it will be composed of all the layers of the duodenum, and the mucosa will show crypts of Lieberkuhn and Brunner's glands (Murchison's case[11]). More commonly, however, the diverticula are of the false type and composed of a mucosa, from which Brunner's glands are usually absent; the muscularis usually forms a well-defined ring at the base, but is deficient over the remainder of the sac, though sometimes a few fibres may be traced for a variable distance over the sac from the neck; occasionally a few atrophic fibres of the muscular coat cover the whole sac. Portions of pancreatic tissue may be found.

Frequency.—These diverticula are undoubtedly much more common than was formerly realised, and probably occur in from 1 to 2 per cent. of human subjects. Baldwin[15], 1911, found 15 diverticula in 115 cadavera. Linsmayer,[16] 1914, found 45 diverticula in 1367 autopsies (3·4 per cent.). Case[17] found 85 diverticula in 6847 X ray examinations (1·2 per cent.). Wyllys Andrews[18] found 26 deformities in 2200 X ray examinations (1·2 per cent.). Spriggs[8] found 10 diverticula in over 1000 X ray examinations. In about one-fifth of the cases the diverticula are multiple and there may be as many as five present.

Age.—Diverticula may be found at all ages from birth onwards, but much more commonly in old subjects; according to Buschi[5] 80 per cent. occur after the age of 50 years.

Pathological Conditions Superimposed upon Diverticula.

Although duodenal diverticula are much more equently present than was formerly imagined, yet thological conditions of these pouches are extremely re, either in the living subject or at necropsy. This ct is, undoubtedly, due to two factors—(*a*) the erility of the duodenal contents, and (*b*) the fact that ere is little tendency to stagnation on account of the de opening into the duodenum and the fluid nature the contents. Infection plus stagnation are the two eat factors in causing inflammation of diverticula, exemplified in the appendix and again in colonic verticula. The rate of emptying of duodenal verticula varies, and, as most frequently there is no usculature in the pouch wall, must of necessity pend largely on mechanical factors, and so be fluenced by the part of the duodenum from which the c originates and the direction it takes. Case,[17] from ray observations, states that the opening of the uch is usually so large that barium leaves almost as pidly as it enters. In a case reported by Basch[19] d operated upon by Elsberg, the pouch was dependent from the junction of the second and third rtions of the duodenum, and bismuth retention curred at the end of 96 hours; this case had sociated symptoms.

The pathological conditions which may be found e: (*a*) Of the diverticulum itself, acute or chronic lammation. (*b*) Results of the spread of inflamman, chronic duodenal catarrh, pancreatitis. (*c*) echanical results: interference with the passage of estinal contents giving rise to duodenal dilatation; struction of the biliary and pancreatic ducts.) Pathological conditions, giving rise to the formation the diverticulum.

Acute Inflammations.—These are rare. Bassett[14] corded a condition discovered post mortem of a uch filled with blood-stained fluid; microscopically e changes were those of a hæmorrhagic inflammation d there was an associated localised pancreatitis. 1919 Akerlund[20] reported a case in which the sac ntained a mass of necrotic pancreatic tissue, which d resulted from extension of the diverticulitis. low is reported a case, admitted as an emergency, in ich there was an acute inflammation of a thinlled friable sac with the mucosa entirely gangrenous.

Chronic Inflammations.—These are considered to be more frequent occurrence; a number of cases have en published in which the symptoms have been ributed to this condition, but as to how far these mptoms are actually due to these diverticula or to ier associated conditions it is difficult to judge at esent, as the pathological state has not usually been ntioned, any post mortem description being mainly ncerned with determining whether the diverticulum true or false.

Results of Spread of Inflammation.

Wilkie[21] in two of his three cases considered that gnation may have led to chronic duodenal catarrh; e of these cases, in which there were associated folds the duodenum, died of hæmorrhagic pancreatitis, e other had a number of associated pathological nditions—viz., duodenal ulcer, cirrhosis of the er, cholecystitis, and gall-stones. Inflammation eading from the diverticulum may involve the sely surrounding pancreas and give rise to a alised condition of chronic pancreatitis with ulting adhesions between the sac and the pancreas. example of such a condition is afforded in a female tient of Case's,[17] aged 45, who complained of pain the lower dorsal region. X ray showed a diverulum in which the food was retained a little longer an it took the stomach to empty. At operation a erticulum was found 5 cm. above the duodenounal flexure; it was not removed because of close hesions to the pancreas; appendicectomy and lecystectomy were performed.

Mechanical Results.—(*a*) Interference with the ssage of intestinal contents. Bauer[6] reported a se in which a large diverticulum of the second portion of the duodenum was thought to have pulled on the pylorus and to have caused persistent vomiting and emaciation; gastro-jejunostomy was performed but failed to stop the vomiting, and death occurred on the eleventh day. Post mortem there was dilatation of the stomach and of the duodenum above the site of the pouch. Similarly, in the case reported by Basch,[19] and operated upon by Elsberg, there was a dilatation of the duodenum above the diverticulum.

(*b*) Obstruction to the biliary and pancreatic ducts. Many of the cases of diverticula are associated with disease of the biliary tract and pancreatitis, as in the case of Wilkie's[21] above mentioned with associated gall-stones. This may be due to a mechanical obstruction of the ducts, or, as suggested by Akerlund,[20] due to a catarrhal inflammation giving rise to swelling and secondary dilatation of the ampulla of Vater, with insufficiency of the sphincter and so a pancreatitis.

(*c*) Pathological conditions associated. These may be either causative of the pouch—e.g., gall-bladder disease, duodenal ulcers, &c.—or merely accidentally associated.

Symptoms and Signs.

As a rule these pouches give rise to no symptoms, because there are rarely any pathological lesions of the diverticula. In cases of acute diverticulitis, as in the case reported below, the symptoms are the same as those of an acute inflammation of any diverticulum, and so will simulate appendicitis in association with an undescended cæcum, and the signs will correspond. In those cases in which the condition is not acute the symptoms will vary and consist of: (*a*) Those of accidentally associated conditions in which the pouch is discovered in the routine X ray examination; (*b*) those due to pathological conditions secondary to the diverticulum—e.g., duodenal obstruction with nausea and vomiting, biliary obstruction, and chronic pancreatitis; (*c*) those due to pathological conditions of the pouch itself. A typical case of this group is one reported by Lewis[22] in a patient who six years previously had an attack of pain two to three hours after meals relieved by the next meal. The condition then subsided, to be followed by a three years' history of pain in the right upper quadrant of the abdomen, radiating to the right shoulder and scapula, this pain coming on two to three times a week. The onset of the pain was gradual, becoming worse during the course of the day and reaching its height at about 5 P.M.; there was occasional nausea and occasional jaundice. Operation showed a diverticulum on the anterior wall of the first stage of the duodenum, and its removal yielded relief of symptoms. Moore[23] also records a case in which the main symptom was pain coming on late after meals, and observes that the pain was worse in the afternoons; this may possibly be due to the pouch filling during the day and emptying during the night.

Other symptoms are nausea, flatulence, "sour stomach," distension, and fullness. It will be seen that such pouches may give symptoms simulating the other surgical dyspepsias—e.g., gall-stones, duodenal ulcer, &c.

Treatment.

As a rule treatment is not required because of the lack of symptoms. On the other hand, if these diverticula are discovered during a barium meal examination of a patient, who is complaining of abdominal symptoms, their removal is indicated. If possible, X ray localisation should be careful and accurate, as otherwise great difficulty may be encountered in finding a retro-peritoneal pouch at operation. The treatment is—(1) invagination of the diverticulum if small, or (2) excision if too large for this form of treatment. On account of narrowing of the lumen of the bowel as a result of excision it may be necessary to combine with the above a gastro-jejunostomy, or, if the pouch is of the third portion of the duodenum, a duodeno-jejunostomy. Occasionally the diverticulum may arise from the first stage of the duodenum and be combined with a pyloric ulcer, as in Murchison's case,[11] when the pylorus and the first portion of the duodenum were removed and anastomosis performed. Mr. Walton's case quoted above affords a similar example.

Case Record.—Married woman aged 27; occupation, household duties.

Past History.—Influenza. No history of indigestion of any description.

Present Illness.—Onset March 20th, 1923, at 1 P.M. Abdominal pain in epigastric region, of a dragging character and giving rise to a feeling of nausea. Later the pain settled in right hypochondrium. Vomited four times.

Progress.—On the 21st, at 3 A.M., pain became worse and persisted until 8 A.M., when it lessened somewhat. Bowels regular; micturition not affected.

Condition on Admission.—Thin woman with a sallow complexion. Temperature 101·3° F., pulse 108 per minute. Abdomen: Marked tenderness and rigidity of the upper half of the right rectus muscle; no palpable tumour; muscles of lower right abdomen flaccid. Hyperæsthesia nil. Urine, heart, lungs, and nervous system, nothing abnormal discovered.

Pre-operative Diagnosis.—Acute inflammation of a vermiform appendix situated under the liver.

Operation.—At 9.45 P.M. on the 21st, under general anæsthesia (A.C.E. and ether), by Mr. W. Thomas. No tumour palpable. Right paramedian incision 4 in. in length, extending upwards from the umbilicus. The cæcum came up freely into the wound and the appendix appeared normal. The appendix was removed. A flake of lymph was observed to come down from the right upper abdomen. On prolongation of incision upwards, the stomach, gall-bladder, and first stage of duodenum were found to be normal. In the area between the duodenum and the gall-bladder and situated on the posterior abdominal wall was a lump, surrounded by an area of infiltration and œdema, and situated in front of the kidney, which could be moved behind it. The gastro-colic omentum was opened and the pancreas found to be apparently normal. An incision was made through the posterior peritoneum above and to the outer side of the duodenum; it was then possible to separate out a pouch from the retroperitoneal tissues. This pouch had a diameter of 1 in., and was thin-walled and black in its centre. (Fig. 1 shows a section of the apex of this diverticulum.) The mucosa was black; the pouch was empty except for a small amount of friable golden-yellow debris; in the lower portion there was a communication into the duodenum in the region of the ampulla of Vater which would admit the little finger. The diverticulum was not connected with the bile ducts. It was cut away, the neck being sutured with a running catgut suture; an endeavour being made to put in a second invaginating suture, bleeding occurred from the inner portion of the neck, and this suture had to be abandoned and the bleeding controlled. The posterior peritoneum was sutured as best possible, but was extremely friable. Stab drainage laterally. Abdomen closed in layers and with tension sutures.

Progress.—Three days after operation the stab wound started to discharge freely and there was a fistulous communication. On the tenth day the stitches were removed, the laparotomy wound having healed by first intention; discharge from the stab wound was diminishing. On the seventeenth day the discharge had ceased and the stab wound was granulating. Patient was sent to convalescent home on twenty-first day.

In conclusion, my thanks are due to Sir Hugh Rigby and Mr. A. J. Walton for kindly giving me permission to publish their cases.

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FURTHER RESEARCH ON THE RELATION OF CARCINOMA TO INFECTION.

BY W. M. FORD ROBERTSON.

IN a paper by my late father, Dr. William For Robertson,[1] read before the Section of Pathology an Bacteriology[2] of the British Medical Associatio Newcastle-upon-Tyne, July, 1921, he recorded tha certain rods which he had observed within cance cells were anaerobic bacilli of the diphtheroid grou of micro-organisms. Further, he brought forwar evidence to show that the continued proliferation the epithelial cells was due to the action of thes bacteria.

As stated in the paper there are, at least, fou distinct methods by which the validity of th hypothesis might be tested: 1. Direct microscopi examination of cancer cells. The rods were demor strated many years ago (THE LANCET, Jan. 28th, 190 by my father's palladium methyl-violet method they occur chiefly within the nucleus and the infecte cells occur in special areas; throughout the greate part of the tumour it may be impossible to observ any of these rods. 2. Artificial cultivation of th supposed bacteria. The evidence of this kind obtaine up to the time at which the paper was published, a pointed out by the author, was, "perhaps not s decisive as that of the other three methods," bu was sufficiently striking. He had isolated anaerobi bacilli of the diphtheroid group from eight carcinomat of the breast. It is to fill up this gap in the evidenc then put forward that the present research ha been undertaken. 3. The experimental production c cancer. Either pure cultures of the anaerobi diphtheroid bacillus, or of cultures of this micro organism, together with cultures of a staphylococcu obtained from the human cases investigated, wer inoculated into mice. Carcinomata were produced i one series of cases, positive results being obtained i all (100 per cent.) of five mice inoculated by th anaerobic diphtheroid bacillus and a mannite non fermenting staphylococcus obtained from the sam human case of adeno-carcinoma of mamma. In thi experimental work it was recorded that micro organisms obtained from a cancerous growth in th human subject produced cancerous growths, primar in various organs (kidney, pancreas, uterus, &c.) c the different mice inoculated. 4. Focal reaction an therapeutic immunisation. Several cases of huma carcinomata were recorded in which definite focal an general reactions occurred after inoculation with vaccine prepared from the diphtheroid bacillus. O certain of these cases, after such vaccine treatment, th neoplasms had decreased in size, the pain and dis comfort from the growth were greatly diminished One case of recurrence after operation was treated, th recurrent growths disappeared, and, at the presen time of writing (July, 1923), the patient is still aliv active, and able to pursue his occupation, that of labouring man.

To complete the cultural evidence it was obviou that a modification of the methods employed up to th date of the paper at the end of 1921 was necessary Dr. Ford Robertson introduced into his technique th de-aeration of pure sheep's serum and, also, o de-aerated hæmoglobin serum glucose agar medium

Before the value of these media could be teste thoroughly Dr. Ford Robertson was taken ill, and th work was carried on by me. The present paper is record of this work.

Throughout my investigation I was in constan personal communication with my father, and, as result of my work, both cultural and therapeutic, h requested me, shortly before he died, to state that h was convinced that the cause of and a cure for cance d been discovered. The laboratory findings orded in the present publication were demonstrated the Section of Pathology and Bacteriology at recent annual meeting of the British Medical sociation.

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[1] An obituary notice of Dr. W. Ford Robertson appeared i THE LANCET of July 28th.—ED. L.

[2] THE LANCET, 1921, ii., 335; Brit. Med. Jour., 1921, ii., 929.

Preparation of Media.

1. *Preparation of De-Aerated Sheep Serum* (*D.A.S. edium*).—For many years Dr. W. Ford Robertson pt a small flock of sheep solely for the purpose of taining blood or serum. A large hollow needle ving been sterilised in boiling vaseline, the excess of seline is shaken out, and the needle is transferred to a rile test-tube which is plugged. The sheep is iced and secured on a trestle sufficiently high to keep feet off the ground. The side of the neck is pped, lathered, and shaved. The wool around the ved part is soaked with a solution of carbolic acid d the shaved skin cleansed with 1 : 50 (about) rbolic acid. The external jugular vein is made to nd out prominently by pressure applied to the ver end. The large sterile needle is inserted into the in at its upper end, and the blood is allowed to w through the needle into 6 in. by 1 in. test- bes, about 40 c.cm. of blood being collected in each be. Twelve tubes are taken at each bleeding. The od is allowed to stand for not more than 24 hours, d then the serum is pipetted or drained off. Any be in which the serum is cloudy and showing a m on the surface is discarded (*Bacillus subtilis* is the st frequent contamination found). Some of the bes occasionally have shown a fatty layer floating on surface of the serum after 24 hours. This is thick d creamy in character, being quite distinct from cloud and scum produced by *B. subtilis*. After canting the serum into sterile test-tubes of ordinary e (5 in. by ½ in.), each of which is half filled, the fatty stance may continue to appear. As many as four trifugings have had to be done in order to clear serum. The centrifuged deposits have been croscopically examined and proved to consist of fat bules, all inoculations from these deposits on to moglobin agar, &c., have proved them to be entirely e from micro-organisms. The ordinary tubes are gged lightly and then transferred to an air-tight ttle attached to a Geryk pump. Air is exhausted til the serum begins to froth, further air being racted when this frothing has ceased. The process repeated every 15 minutes throughout the day. e tubes are incubated in vacuo until required for , a periodical examination being made for the sence of cloud or marked deposit. Any so ected are centrifuged and tested for sterility. the serum remains clear from the beginning, con- nination rarely occurs later if care is taken with plugging before storage. The presence of the fat, wever, may give a little trouble, but this merely uires the serum to be centrifuged and the clear d decanted into a fresh sterile tube. In some es it has been found useful to acidify the de-aerated um by bubbling CO_2 gas through it for five minutes A.S. + CO_2). When required for use the de-aerated ep serum is decanted into small tubes measuring n. by ¼ in., which are sealed with corks soaked with ling paraffin wax.

. *Preparation of De-Aerated Hæmoglobin Serum cose Agar* (*Glucose Agar* + 12).—After pouring off serum from the blood in the large tubes as cribed above, the blood-clot is allowed to stand for rther 48 hours. To produce lysis of the corpuscles tubes are kept overnight in a freezing mixture of and water, after which they are warmed up in a in of water at 60° C. for 10 minutes. They are n kept 24 hours before decanting into large sterile es. The hæmoglobin serum is then de-aerated by same method as described for de-aeration of the e serum. Freshly sterilised agar, in a test-tube of inary size, is cooled down to about 70° C., and a drops of the de-aerated hæmoglobin serum are led and mixed. The tubes are sloped and the tents allowed to solidify. A sterile cotton-wool g, half an inch in length, is pushed down to just ve the upper limit of the agar. A small amount of pyrogallic acid is shaken on to the top of the plug, a few drops of sodium hydroxide solution (10 per cent. in water) are added, and the test-tube is sealed by a cork soaked in boiling paraffin wax. The tubes are incubated at 37° C. for 24 hours to test their sterility, and are then stored for use. The glucose agar is made according to the technique given in "Therapeutic Immunisation in Asylum and General Practice," by W. Ford Robertson, Chap. V., "Bacteriological Methods." The acidity of the agar is + 12.

3. *Other Media Used.*—Other media used have been made according to the instructions contained in "Therapeutic Immunisation in Asylum and General Practice" referred to above. In some cases Dorset egg medium has been made with the addition of de-aerated hæmoglobin serum, and has proved a valuable medium in the research. In several instances, to obtain the earlier subcultures, Dorset egg medium was necessary.

Technique for Inoculation of Media.—A small cube of about ½ in. square is cut out with strict aseptic precautions from the deeper margin of a neoplasm removed at operation. Culture must be made not later than 8 to 12 hours after operation. With lymphatic glands containing metastatic growths the whole gland may be used if small enough. The cube removed is cut up into small portions of such size as to be capable of insertion into the 2 in. by ¼ in. test-tubes. (*a*) One of these portions of tissue is pushed down with a sterile glass rod into each of two D.A.S. tubes and into two D.A.S. + CO_2 tubes until it is just below the surface of the medium. The paraffin cork is re-heated and re-inserted. The tubes are then incubated at 37° C. (*b*) The remaining pieces of the tissue are cut up into small fragments and placed in a strong test-tube containing ¼ inch of sterile ground glass. About ½ in. of sterile normal saline solution is added and the whole ground up by a sterile glass rod. A few loopfuls of this solution are used to inoculate the following media: (1) One or two tubes containing "glucose agar + 12" medium and rendered anaerobic by the pyrogallic acid method (see above). (2) One tube containing Dorset egg medium; after inoculation the air is displaced by CO_2 gas and the tube is sealed with a plug of wool soaked in hot paraffin. (3) Instead of tube (4) in some cases Dorset egg medium, to which had been added de-aerated hæmoglobin serum (see above) is used. After inoculation the air is displaced by CO_2. (5) Two tubes containing ordinary hæmoglobin agar + 18. One of the tubes is rendered anaerobic by the pyrogallic method, the other being incubated anaerobically. (6) One tube containing ordinary lactose serum agar incubated aerobically. All these tubes were incubated at 37° C.

Addendum on Technique.—Recently a modification of the cultural technique has been employed which has proved of great use in making early subcultures and in dealing with weekly growing strains of the anaerobic diphtheroid bacillus. This technique was devised to bridge over the gap existing between the fluid D.A.S. and D.A.S. + CO_2 media and the comparatively dry condition of the surface media in the glucose agar + 12 tubes, the transition from one to the other being too sharp. A small amount of D.A.S. was poured into a tube containing glucose agar + 12 medium sufficient to form a layer 1 mm. thick and allowed to collect at the bottom. The surface of the tube was then inoculated with a loopful or more of the deposit. A small sterile plug was next inserted and pushed down a short distance from the upper limit of the medium. On this plug a layer of ⅛ in. finely powdered calcium chloride was dropped, which was covered by another sterile wool plug ½ in. in thickness. On this plug a thin layer of pyrogallic acid was laid, and a few drops of sodium hydroxide (10 per cent. sol.) was added. The mouth of the tube was then sealed with a cork previously soaked in boiling paraffin wax. The tube is now laid flat, so that the serum formed an even layer over the medium, the whole being incubated for 36 hours. After this time the calcium chloride has absorbed all the water from the serum and a dry or sticky surface is left. The tube can be incubated in a vertical position. This method has been found valuable also in increasing the vigour of pure anaerobic growths after prolonged subculture and incubation. Three different strains of anaerobic diphtheroids from separate cases have been restored to vigour by this means.

Examination of Culture Media.

All the inoculated tubes (1) to (6) inclusive in the previous paragraphs were examined for growth after 24 to 48 hours' incubation. Those tubes showing no visible growth, or only a sparse growth, were replaced in the incubator. From those tubes in which there was a copious growth, films were made and stained by Gram-neutral red method and examined microscopically. A note was made as to the group of micro-organisms (streptococci, staphylococci, &c.) present, but no further investigation of these was made except in those particular instances in which subsequent examination of the anaerobic diphtheroid bacillus, subcultured from the D.A.S. culture, showed micro-organisms resembling somewhat streptococcal forms. In such cases any streptococcal colonies and suspected diphtheroid colonies were subjected to a series of biochemical tests to differentiate the species (lactose, mannite, salicin, and lactose serum broth).

With reference to the D.A.S. and D.A.S. + CO_2 tubes it was found that the time required for primary incubation varied according to the malignancy of the neoplasm. The more malignant the tumour, the shorter the time required before examination. For example, in the case of a rapidly growing epithelioma, the anaerobic diphtheroid bacillus was found in enormous numbers after four days' incubation at 37° C., whereas, in an atrophic scirrhus, after one week's incubation at 37° C., comparatively few diphtheroid bacilli were present. In some cases the serum in the tubes became cloudy owing to the presence of streptococci, but these tubes, as well as those in which the serum remained clear, showed a white deposit varying greatly in amount. A loopful of the deposit, or if the latter was copious, a little removed in a capillary tube, was used to make a thin film. It was found better to dilute the serum on the slide with distilled water, to avoid too deep staining of the background. The film was stained by Gram neutral red. As in any film containing serum, decolorisation by alcohol was continued only until the violet stain ceased to stream away. If an attempt was made to decolorise the background completely all the micro-organisms on the film would naturally be decolorised. Further, the gentian-violet solution was filtered on to the preparation. It was found that the white deposit consisted of bacteria and disintegrated tissue. Often partially disintegrated epithelial cells were seen. The background consisted of a very finely granular field which should not be mistaken for micro-organisms and is present in films made of uninoculated serum. The amount of white deposit was found to have a relationship to the numbers of micro-organisms present other than the anaerobic diphtheroid bacillus. The greater the number of streptococci, staphylococci, &c., present, the larger the deposit. The growth was then subcultured from the primary growth in D.A.S. and D.A.S. + CO_2 media. The white deposit in the primary D.A.S. and D.A.S. + CO_2 culture was used to inoculate the Dorset egg + CO_2 medium and G.Ag + 12. Two tubes of each of these media were used. These subculture tubes were incubated at 37° C. The colonies of the diphtheroid bacillus were visible on the egg medium after three to seven days, but, owing to delay in examination, consequent on the large number of tubes dealt with, the colonies had, in some cases, become quite large when first examined. Further subcultures were made to obtain the anaerobic diphtheroid bacillus in pure growth. The media used for these subcultures were either Dorset egg medium + CO_2 or glucose agar + 12 according to the medium on which the first subculture of the particular strain had grown best. For study of characteristics of colonies and picking of them off for pure subcultures, a strong hand-lens was used with double-jointed movable spring clip. The clip attaches the lens to the tube, thereby allowing the apparatus to be slipped along the tube and focused easily on any particular colony. The tube with clip attached is held in the left hand, and the platinum needle is inserted and a colony picked off under the lens.

Cultural Characters and Morphology of the Anaerobic Diphtheroid Bacillus.

In pure cultures on Dorset egg medium + CO_2, to which a few drops of alcoholic solution of basic fuchsin have been added, after 24 to 48 hours the colonies, as seen through a strong hand-lens, appeared as minute rounded, semi-transparent, white or pinkish growths. In those cases in which the colonies were pinkish the colour was due to the bacilli having taken up the stain, as when removed by the platinum needle the colony on the needle showed the pinkish coloration. The colonies were soft and slightly sticky, except in one case in which the culture was first examined after six days, and showed soft colonies and colonies which were granite-like and very difficult to break up.

In pure culture on glucose agar + 12, after 24 to 48 hours, the colonies as seen under a strong hand-lens, appeared as minute round transparent moist colonies. Subsequently as they increased in size they became semi-transparent and later yellow or greenish-yellow, while the medium became cloudy and dirty brown. Again, other species took on a pink coloration, with very little change in the medium. After about two weeks' incubation at 37° C. the colonies were the same dirty-brown colour as the medium.

Films of the anaerobic diphtheroid bacillus made from cultures show it to be an incompletely Gram-fast rod. In de-aerated serum the micro-organism occurs singly and in clumps, its length varying from 0·5 to 2 microns, its breadth being 0·2 micron. On Dorset egg medium + CO_2 and on glucose agar + 12 the micro-organism frequently shows pleomorphism. Numerous short coccoid forms occur, these being found sometimes in chains of five or six elements. The elements forming the chains are connected by a faintly staining filamentous sheath. Small rods in short-chain formation, with or without connecting filamentous sheath, occur. Some strains are uniformly longer rods 1·5 to 2 microns in length; curved and V-shaped forms are seen also. Other strains are uniformly short, being 1 micron in length. Bacilli with a thick club-shaped extremity and bacilli with a bulbous centre occur occasionally, especially in old cultures.

Material Examined.

The series examined in the present research consists of 15 cases of malignant disease. It comprises six cases of adeno-carcinoma of the mamma, three being scirrhus and three being encephaloid in type: One case of primary liver-celled carcinoma and the discharge from the wound after operation, one case of squamous-celled carcinoma, metastatic in submaxillary lymphatic gland, the primary neoplasm being from the lower lip; one case of carcinoma of the maxillary sinus; one case of sarcoma of the maxilla; one case of adeno-carcinoma of rectum; one case of adeno-carcinoma of the ovary, papilliferous in type; one case of squamous-celled carcinoma of cheek; one case of squamous-celled carcinoma of glans penis; swab from squamous-celled carcinoma of the cheek. From all these 15 cases the anaerobic diphtheroid bacillus has been demonstrated in cultures. In seven cases the bacillus was obtained subsequently in pure cultures in sufficient quantity for vaccines to be prepared and used therapeutically. The results obtained by this vaccine treatment will be published later. In all 15 cases a mannite non-fermenting staphylococcus was isolated, and in about two-thirds of the series streptococci were present also. In nearly every instance these staphylococci and streptococci were obtained only in anaerobic cultures. Two control cases were examined. In one case subcutaneous fat, and, in the other case, muscle of patients who were not the subject of malignant disease, gave negative results for the anaerobic diphtheroid bacillus.

I wish to express my gratitude to the various urgeons in Edinburgh and in Dunfermline, who have upplied me with material for this investigation, and specially to Mr. George Chiene and to Mr. Pirie Watson, who have given me every facility for arrying out the work. I am indebted also to Mr. Becker for his great kindness in helping me to collect he material, and to Dr. Batty Tuke for the interest e has shown and the encouragement he has iven me.

Reviews and Notices of Books.

HEREDITY AND EUGENICS.

By R. R. GATES, Ph.D., Professor of Botany in the University of London. London: Constable and Co. 1923. Pp. 288. 21*s*.

THIS entertaining book should be closely read by all vho are interested in human inheritance, especially f they approach the subject with the idea of doing omething to make man better than he is. After a eneral introduction the author gives a pretty full ccount of what is known about the inheritance of bnormalities in man, a long discussion on twins and heir resemblances, and concludes with a survey of he mass of questions involved in "eugenics" and population." There is a good bibliography of books nd papers. Two conclusions come out particularly rominently.

In the first place, it is plain that there are many oors of human inheritance which the key of Mendelism 1 its simplest form will not unlock, and when Iendelism passes on to reversed dominance, multiple actors, and such like, the practical sociologist may well eel that the problem is more difficult than he thought was. It is well that he should do so, for there has een much easy talk in recent years of the possibility f the regeneration of man if only geneticists could ave their way. Left-handedness, for example, was riginally found to be a simple Mendelian recessive haracter. More recent investigation has, however, iggested that the mode of inheritance is not altogether lear, and that right- and left-handedness are not lternative characters but in their most marked forms ne ends of a series with a large number of intermediate gradations—i.e., that many factors are ivolved. In the second place, one is impressed by the ict that even if the modes of inheritance of undesirable and desirable human qualities were known, it ould be by no means an easy matter to eradicate or ıltivate them unless the character in question is a mple dominant with a single factor. There is no articular reason for abolishing bradydactyly, but as is a simple dominant character it could be kept nder by preventing anyone who showed it from reeding and keeping a close watch for its possible eappearance de novo.

But musical ability and feeble-mindedness are cessive characters, and when the homozygous have een mated together or sterilised as may be appropriate ie human breeder has still to deal with the heterozygous individuals who are carrying but not showing ie character. It is reckoned, for example, that in the nited States about 3 per 1000 of the population are entally defective, and that at least 70 per 1000 are ırrying mental deficiency as a recessive character. the former mate together there is a certainty of efective children; if two of the latter happen to arry—and the chance is obviously not a very small ie, even if cousin matings are barred—a quarter of ieir offspring will be defective. As Prof. R. C. Punnett is pointed out, it would take some 250 generations, about 8000 years, to reduce the feeble-minded from per 1000 to 1 per 100,000 by simply segregating or erilising those who show the character. And when comes to characters which are not single factors, ie complications seem almost insuperable. Truly it ems sometimes that the function of natural knowdge is to explain why things are as they are without ving us any easy way by which to make them better. No doubt in the end it will be possible to do a good deal, but the time for action on a large scale has certainly not arrived yet.

An interesting discussion of the effects of racial interbreeding points out that in fact very few detailed studies have been made; such information as there is suggests strongly that the miscegenation of races which are far apart in the scale of social and intellectual development or markedly dissimilar physically is likely to give results which are in general bad, owing to a disharmonious mixture in the offspring violating the unity and wholeness which are characteristic of a perfect individual. The colour question needs clear thinking in all its aspects; it appears that facts to think about are wanted even more. Many of the qualities which future generations will value most highly may well be recessive.

HERNIA AND ITS RADICAL CURE.

By J. HUTCHINSON, F.R.C.S. Eng., Consulting Surgeon, London Hospital. Oxford Medical Publications. London: Henry Frowde and Hodder and Stoughton. 1923. Pp. 264. 12*s*. 6*d*.

THE frequency with which operations for hernia are nowadays performed has led to the difficulties being sometimes under-estimated, and we must admit that a few years ago hernia operations on soldiers were followed in too many cases by recurrence and other complications that could have been avoided by more careful and accurate methods. Mr. Hutchinson's book is therefore doubly welcome, for from the fruits of a wide experience he has made it his aim to give a practical account of hernia and the best methods for its radical cure. Many of the technical details that the author describes have been originated by himself, and while his methods are mainly in accordance with those used by the majority of British surgeons, he describes fully the less orthodox methods of others; in this way a thoroughly up-to-date account has been produced, and comparisons of various procedures are made in a fair and broad-minded spirit.

Mr. Hutchinson does not hold the view that the majority of inguinal hernias have a congenital origin, and he considers that nearly all umbilical and femoral hernias are acquired. A full and valuable account is given of the contents of hernial sacs, and special interest attaches to the sections on hernia of the vermiform appendix and of the urinary bladder, and on the various forms of fatty hernia. In inguinal hernia, where there is a well-developed conjoined tendon, the author sutures this tendon in front of the cord to the external oblique just above Poupart's ligament, thus allowing the cord to remain in its normal bed formed by that ligament; if the conjoined tendon is poorly developed Halsted's operation is preferred. The difficulties and dangers of operation for recurrent inguinal hernia are dealt with and, many exceptions being admitted, the general rule is laid down that it is better not to operate again where a suitable truss effectively controls a recurrent inguinal hernia. For imperfect descent of the testicle early operation is advocated, the testicle being brought down to the scrotum; the means of keeping it there are indicated. In femoral hernia the author is accustomed to operate from below and to suture Poupart's ligament to the pectineus fascia, but he also describes and discusses fairly Lotheisen's method that has become popular among so many other surgeons. For umbilical hernia Mr. Hutchinson describes his own method of closing the abdominal wall by two rows of sutures, the first a layer of mattress stitches taking tension off the second row. He is a firm advocate of the use of kangaroo tendon sutures, and he brings forward evidence to show that these are not absorbed but become incorporated in the body as firm fibrous tissue, with considerable advantages over catgut on the one hand, and such substances as silk and silkworm gut, which persist as foreign bodies. Metal filigrees are condemned and the author's opinions are confirmed by the increasing rarity with which such materials have been employed in recent years. The diagnosis and treatment of strangulation are well described; where resection is necessary Mr. Hutchinson advises delivery of the bowel through a separate abdominal incision and he is in favour of end-to-end anastomosis.

The interest and value of the book are enhanced by the frequent descriptions of unusual cases and the numerous references to recent literature; its size has been limited by the omission of such details of anatomy, differential diagnosis, and treatment by trusses as have received full attention in many text-books; instead, the author has devoted himself primarily to a detailed account of the operative measures which in his large experience he has found suitable to all the different forms of hernia. As he writes clearly and his technical descriptions are easy to follow and well illustrated by diagrams, Mr. Hutchinson has fulfilled his object of producing a book of value to surgeons on a subject of considerable importance to the community.

The Mechanism of Facial Expression.

Der Gesichtsausdruck und seine Bahnen, beim Gesunden und Kranken besonders beim Geisteskranken. By Prof. Dr. Theodor Kirchhoff in Schleswig. Berlin: Julius Springer. 1922. With 68 illustrations. Pp. 227. 9*s.*

The clinical part of this interesting monograph is peculiarly full and detailed; that dealing with pathological physiology is somewhat unsatisfactory. Prof. Kirchhoff apparently accepts without criticism the view that a second (non-pyramidal) facial path exists, extending from the cortex to the thalamus and from the latter ganglion to the nucleus ruber and so by rubro-pontine paths to the facial nucleus. This "affektbahn," however, is, to say the least, problematical. Many difficulties connected with the assigning to the optic thalamus of the function of emotional expression are not, we consider, sufficiently tackled by the author, who relies largely on observations now somewhat old, and does not, in our opinion, meet successfully the objections raised by Roussy to a thalamic localisation for emotional play of feature. The monograph is none the less instructive and readable, and supplies in convenient compass a great deal of clinical material of interest both to psychiatrist and neurologist.

The Corneo-Scleral Dome.

La calotte cornéo-scleral. By Dr. F. Terrien, Ophthalmologist to the Beaujon Hospital, Paris. With 144 figures. Paris: Masson et Cie. 1923. Pp. 260. Fr.25.

This treatise appears as one of a series entitled "Sémiologie Oculaire." The same author has previously written a work on the surgery of the eye and its annexes, and in attempting to deal solely with the anatomy, physiology, and pathology of the anterior part of the globe has set himself a somewhat thankless task. As far as conjunctival infections go, they can, it is true, be dealt with satisfactorily without reference to the rest of the eye, and this is perhaps also true of superficial affections of the cornea. Interstitial keratitis, however, may or may not be attended by inflammation of the iris and choroid, and the sign popularly known as "keratitis punctata" is always the result of a cyclitis. Again, penetrating wounds of the cornea involve the possibility of prolapse of the iris, of traumatic cataract, and of the presence of a foreign body in the globe. All this necessitates considerations which go far deeper than the corneo-scleral dome, and accordingly, in this treatise, we have the radiographic diagnosis of foreign bodies and the methods of their extraction by the giant, and by the small electro-magnet. Similarly, the proper treatment of serpiginous ulcer of the cornea cannot be carried out without a knowledge of the bacteriology and surgery of the lacrymal sac. These facts are not ignored, but they are perhaps hardly given their due weight in this book. Looking for compensating advantages in Dr. Terrien's method of approaching his subject, we find a useful description of the examination of the cornea in the living subject by the corneal microscope and slit lamp, and an excellent figure showing the magnified vessels, both blood and lymph, of the limbus. The bulk of the book, however, resembles chapters out of an ordinary text-book. Terrien can write most interestingly of his own original observations, as in his book on oculo-orbital sequelæ, but in this book the advantages over the average full text-book are not very apparent.

Inflammation of Bones and Joints.

By Leonard W. Ely, M.D., Associate Professor of Surgery, Stanford University. London and Philadelphia: J. B. Lippincott Co. 1923. Pp. 433. 30*s.*

The treatment of diseases of joints has advanced but little of recent years, so that we turn to a monograph dealing with this branch of surgery with some interest. Prof. Ely's book treats of bone diseases as well as affections of joints. On the whole it is disappointing. In bulk it occupies considerably more space than is devoted to these subjects in the ordinary student's text-book of surgery, yet the reader will get little more help and information from it. Splints and apparatus are scarcely more than mentioned; there is no detailed description of their application. There is no account of the filling of bone cavities with pedicled muscular or with fat-grafts, nor do we find any reference to Wilms's method of treating septic joints. The author ascribes the localisation of bacteria in the ends of bones to the marrow in this situation being of a particular type, the lymphoid type, but he leaves only a vague impression as to what he really means by this. Speaking of the diagnosis of tuberculous joints, he points out that many non-tuberculous joint infections have on clinical grounds been regarded as due to the tubercle bacillus, and that such a diagnosis can only be established with certainty by the demonstration of the organisms in the joint fluid or synovial membrane. Prof. Ely's views on the influence of age upon the treatment of tuberculous joints are interesting and worth further investigation. He believes that this infection only attacks the synovial membrane and the lymphoid marrow of the bone-ends. Whilst it is possible to remove these two tissues in adults, it is quite impossible in children. Therefore, in adults resection should be the rule. Loss of joint function leads to disappearance of synovial membrane, a change in the marrow of the adjacent bones, and an inability of the disease to progress. He is satisfyingly frank about the results of our treatment in certain cases of chronic rheumatoid arthritis, stating that no known remedies can influence the course of the disease in the slightest. Admissions of this kind do much to stimulate the investigation of those hopeless diseases against which our present knowledge cannot prevail.

Kala-Azar.

A Handbook for Students and Practitioners. By L. Everard Napier, M.R.C.S., L.R.C.P. Lond., in charge of Kala-azar Research, Calcutta School of Tropical Medicine; and Ernest Muir, M.D., F.R.C.S. Edin., of the Calcutta School of Tropical Medicine. London: Humphrey Milford. Oxford University Press. 1923. Pp. 160. 8*s.* 6*d.*

This handbook represents an elaboration by Dr. Napier of a somewhat similar, but smaller, volume written by Dr. Muir several years ago. The objects of the present volume are twofold: to record briefly and concisely the facts of the disease as at present known and to indicate the lines on which future research should be conducted, especially as regards the transmission of the disease. The three principal foci of the disease in India are Assam, Bengal, and Madras; on the other hand, Burmah, Ceylon, Bombay, the Punjab, and the N.W. Frontier Province have only recorded imported cases. To all intents and purposes, though the disease occurs in other parts of the tropics and subtropics, kala-azar is essentially an Indian disease, and its complete elucidation a matter of primary mportance to that country. This book, then, fulfils n admirable purpose in setting forth succinctly all hat is known about the disease as it occurs in India. The section dealing with the pathology of the blood, describing the formaldehyde test, or the formol-gel reaction, which may be taken as absolutely diagnostic of kala-azar, is specially to be commended. Spleen puncture is regarded as a perfectly safe operation, we are glad to note, but there appears to be nothing to recommend sternum puncture as a means of investigating the bone-marrow with a view to diagnosis. The clinical descriptions and the methods of treatment are particularly complete and are, therefore, welcome o the sincere student of tropical medicine. While strongly advocating the specificity of antimony tartrate in this disease, the authors are careful to express the opinion that finality has by no means as yet been reached, and that the future is dependent upon investigations upon the pharmacology and biochemistry of the antimony salts. In regard to these aspects of treatment little, if any, investigation has as yet been attempted.

THE new edition of Delafield and Prudden's ‘Text-book on Pathology," reviewed last week in this olumn, is published in England by Messrs. John Bale, Sons nd Danielsson, Ltd.

JOURNALS.

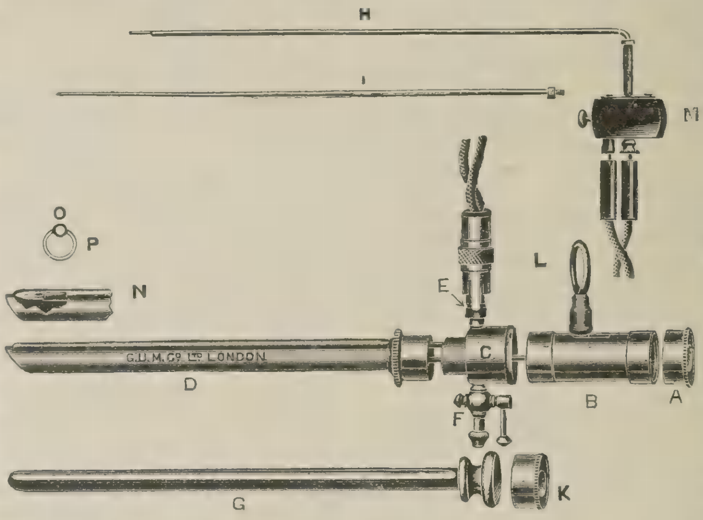
BRAIN. Vol. XLVI., Part 1.—On Certain Tonic or Postural Reflexes in Hemiplegia, with Special Reference o the so-called "Associated Movements," by F. M. R. Walshe. Continuing his brilliant researches into the phenomena of hemiplegia the author analyses a series f cases showing the so-called "associated movements." He concludes that they are tonic or postural reflex actions allied to the tonic neck and labyrinthine reflexes of Magnus and de Kleijn. They are best elicited by tonic voluntary activity of the normal limbs, nd in these circumstances may be described, following Magnus's nomenclature, as "tonic reflexes arising in he limbs and acting on the limbs." The point illustrated by associated reactions, whatever their place f origin and seat of response, is that while the tone of given muscle depends primarily and essentially upon he integrity of its own afferent supply, yet this tone is onstantly influenced and modified by impulses arising n proprioceptive end-organs elsewhere in the body.—The Oculomotor Nucleus of Tarsius and Nycticebus, y John I. Hunter. They exhibit the presence of a entral nucleus of Perlia which is smaller than in the nthropoidea. The Edinger-Westphal nucleus is in ach case single; it is also concluded that relatively ew optic fibres fail to cross in the optic chiasma. hese differences from the anthropoidea are believed o indicate that stereoscopic vision has not yet been properly attained.—Lethargic Encephalitis and Herpes ebrilis, by Z. Szymanowski and Nathalie Zylberlast-and. By inoculation of the cornea of rabbits with aterial from the idiopathic herpes and from herpes ssociated with cerebro-spinal fever and scrofulosis the uthors produce evidence to show that the pathological hanges in the brain resulting therefrom are identical ith those due to encephalitis lethargica. As a control ther rabbits were inoculated with the virus of ncephalitis lethargica itself. It is interesting to note hat these observers found inflammatory changes in he liver in all their animals, whether inoculated with erpes or with encephalitis lethargica.—Dystrophia yotonica (Myotonia Atrophica), by W. J. Adie and G. Greenfield. A brief review of the history of this sease is given together with a full description of an utopsy, believed to be the first to take place in this ountry, and a description of the disease based upon cases observed by the authors. They conclude hat dystrophia myotonica is a disease *sui generis* ithin the group of heredo-familial degenerative sorders. The fully developed disease is confined in he main to one generation (the dystrophic generation) here it occurs in some members of a number of milies of the same child-rank to a common ancestor. this generation some members remain healthy, some may have cataract alone, some may suffer from the disease in an incomplete form; whilst others present the combination of muscular atrophy and myotonia with certain extra-muscular symptoms for which the name dystrophia myotonica has hitherto been reserved.—Iron in the Brain, by A. Gans. A description is given of the various methods of obtaining the iron reaction in the brain together with some results obtained, with the object of directing attention to the importance of this promising method of research.

JOURNAL OF PATHOLOGY AND BACTERIOLOGY. Vol. XXVI., No. 3. July 1923. Pp. 305–432.—The Cultivation of Anaerobes in Auto-digest of Pancreas, by F. P. G. de Smidt. A medium made by incubating minced pancreas with chloroform for 24 hours gives free growth of anaerobes and other organisms and has a high concentration of amino-acids. Quantitative measurements of the relation of growth to reaction are given.—On Catalase in Bacteria and its Relation to Anaerobiosis, by A. B. Callow. Aerobes (except streptococci) have considerable amounts of catalase, anaerobes none. It is therefore possible that anaerobes fail to grow in the presence of oxygen because they are killed by the hydrogen peroxide which is then produced and not destroyed by catalase.—Bacterial Catalase, Anaerobes, and Oxygen, by J. W. McLeod and J. Gordon. In two papers the authors give much further information about the presence of catalase in and the production of hydrogen peroxide by a number of bacteria and suggest a classification based on these properties. In the presence of oxygen anaerobes produce hydrogen peroxide to which they are very sensitive. Ordinary media exposed to light are unsuitable for the growth of anaerobes and other organisms which are sensitive to peroxides owing to the development of traces of these substances in the medium.—Observations on Granules of Nucleolar Origin found in the Cells of Malignant Neoplasms during Mitosis, by H. A. Haig.—The Complement-fixation Test in Tuberculosis, by H. L. Coulthard. A thorough investigation of the various preparations of tubercle bacilli which have been used in the complement-fixation test leads the author to prefer simple suspensions of killed bacilli in saline. The reaction is highly specific, but is given by not more than 80 per cent. of cases of pulmonary tuberculosis and 50 per cent. of other forms. Acute infections generally give negative results and the strongest reactions are given by cases of chronic phthisis which are doing well; cases which are failing become weak or negative. The reaction therefore may be of some prognostic value.—The Glands of Internal Secretion in Experimental Avian Beri-beri, by V. Korenchevsky. Deprivation of vitamin B leads to hypertrophy of the adrenals, atrophy of the thymus, and atrophy of the splenic pulp; less constantly to activity of the thyroid, hypertrophy of the interstitial cells of the testis, and increase of the light cells of the pituitary.—The Influence of the Mother's Diet during Pregnancy and Lactation on the Growth, General Nourishment, and Skeleton of Young Rats, by V. Korenchevsky and M. Carr. Proper supplies of fat-soluble vitamin and calcium to the mother during pregnancy and lactation are most important for the welfare of the young.—Heteromorphosis (Metaplasia) of the Alimentary Tract, by G. W. Nicholson. The author describes gastric mucous membrane in a persistent vitelline duct, in Meckel's diverticulum, in a cyst of the pancreas, in inflamed gall-bladders, and in a tuberculous ulcer of colon. He points out that these abnormalities support an epigenetic mechanism of development and differentiation—i.e., environment determines which of the many potencies of cells shall be dominant.—Titration of Complement in the Wassermann Reaction, by F. C. Lewis. More delicate results are obtained by a finer gradation of quantities of complement than is generally used.—Bordet's Extract in the Wassermann Reaction, by H. D. Wright. Works as well as the more usual preparations, is stable and convenient.—A New Method of Decalcification, by C. Powell White. A solution of ammonium citrate, neutral or even alkaline, has no harmful effect on the tissues and leaves the staining unaffected.—Method of Mounting Museum Specimens, by G. S. Williamson and I. H. Pearse. Labels on thin celluloid mounted in gelatin.—" Minute Bodies " in Two Cases of Epidemic Encephalitis, by C. Da Fano. A further account of the occurrence of the stainable particles, possibly parasites, previously described by the author. —Pneumococcal Endocarditis in Rabbits, by W. Mair.—The Effect of the Individual Host on the Virulence of Pneumococci, by C. H. Browning and R. Gulbrausen.—On *Bacillus coli anaerogenes*, by D. Nabarro. An account of the occurrence, variation, and serological reactions of a number of non-gas-forming strains.—The Origin of the Mononuclear Phagocytes of the Lung, by D. F. Cappell. The phagocytic cells of the alveoli are at first derived from special areas of the alveolar epithelium and in the later stages of irritation from the endothelial cells in the alveolar walls.—Modification of Victoria Blue Method of Auglade and Morel for Neuroglia Fibres in Frozen Sections, by J. Anderson.—An excellent photogravure of the late Prof. James Ritchie, for many years secretary of the Pathological Society and editor of the journal, is issued with the present number.

New Inventions.

A NEW URETHROSCOPE AND ITS USE AS A VAGINOSCOPE FOR THE TREATMENT OF VULVO-VAGINITIS IN CHILDREN.

Those who prefer a light urethroscope with the lamp at the end of the cannula may be interested in a new pattern, which has the advantages that the lamp-stem cannot obstruct the field of view; the lamp-bulb is in a recess and does not shine into the observer's eye; the operating attachment is very light, easy, and precise in action, and the instrument, with electro-cautery attached, weighs less than three ounces. The cannula, D, shown in the figure, has its end bevelled, and the lamp-stem is carried in a special tube in the long side of the cannula as shown at N, the bulb being very close to the end so that it lies in a recess and shines across the field. After removal of the introducer, G, the lamp, carried on C, is passed down the side-tube, shown in cross-section at O P; and the diagnostic eye-piece, K, is fitted into C, which has on one side the electrical switch, E, and on the other the bellows attachment, F. The operative attachment, B, is very simple. It consists of an outer cylinder with a longitudinal slot in one side, up and down which the handle of the instrument, L, can travel. In order to retain the air on inflation, the slot is covered by an internal cylinder fitting the outer one very closely. This internal cylinder has a short metal tube set in it at right angles to the long axis, so that it lies within the slot in the outer cylinder. Through the metal tube is passed the handle of the instrument, the stem of which is screw-threaded, as shown on I, so that it can be screwed into the head of the handle within the instrument. The whole is made airtight by a short piece of rubber tube, one end of which grasps the instrument handle and the other the tube through which this is passed. The electro-cautery is carried in the same way as the ordinary instrument and handle, the portion H being detachable from M, so that it can be passed up the inside of the operating attachment and fitted to the portion M, which carries the terminals and switch, and is fitted into the tube mentioned above in much the same manner as the ordinary instrument. A different eye-piece, A, is employed in the operative attachment, owing to the longer focus required. I have found the electro-cautery wonderfully convenient, as it is a very simple matter to bring the end into contact with any part required and then to turn on the current by pressing the button switch shown opposite to M in the diagram. This instrument with larger cannulas—namely, 28, 30, 32, and 34 F—is being used in the V.D. department at St. Thomas's Hospital for the treatment of vulvo-vaginitis in children. Evidence proves that one reason for the failure of ordinary methods of treatment of this troublesome complaint is that under the ordinary douching and swabbing which are usually employed the medicament does not reach infecting organisms in the fornices of the vagina.



The plan of treatment adopted, which has so far given very promising results, is to pass the largest cannula, with the introducer, which the hymen will allow. The introducer is removed, the lamp attachment inserted, and the vagina inspected under air inflation, as in ordinary urethroscopy. The view of the cervix and fornices which is obtained in this way is perfect. After this the outside of the cervix and the whole surface of the upper reaches of the vagina are painted with 25 per cent. mercurochrome 220. This can be done either by passing a dressed urethroscopic stick through the cannula after removing the eye-piece, or under air inflation by using the operating attachment and a dressed probe. Whichever method is chosen, the operation is not complete until every nook and cranny has been treated, as verified by inspection under air inflation. Care is taken that the dye does not reach down as far as the vulva in such strength: it will trickle down later, but will by then have become diluted. Naturally, the urethra and other infected parts must also be treated, but the method outlined above of insuring that every part of the vagina is reached by the chosen medicament seems rational, and the results have certainly been most encouraging. So far only mercurochrome has been tried; doubtless a large array of other drugs will suggest themselves to workers in this field.

The instrument has been made for me by the Genito-Urinary Manufacturing Co., 66, Margaret-street, London, W. 1.

L. W. Harrison, D.S.O.,
St. Thomas's Hospital, S.E. Colonel, R.A.M.C. (ret.).

From the list of Birthday Honours which appeared in The Lancet of June 9th was accidentally omitted the name of Lieut.-Colonel T. R. St.-Johnston, C.M.G., who was a medical officer in Fiji for over ten years, and is now Colonial Secretary of the Leeward Islands. His " South Sea Reminiscences " were recently reviewed in our columns.

Public Health Services.

REPORTS OF MEDICAL OFFICERS OF HEALTH.

THE following are some of the principal health tatistics of a group of county and rural districts for 922 :—

District.	Estimated (R.-G.) mid-year population.	Birth-rate.	Death-rates per 1000 of the population.				Death-rates per 1000 births.		
							Infant mortality		
			All causes.	Tuberculosis.	Cancer.	Respiratory with influenza.	Legit.	Illegit.	Maternal mort. in childbirth.
ertfordshire ..	334,706	17·4	10·7	0·7	1·3	2·3	52	129	4·5
erefordshire C.D.	50,523	20·4	15·4	1·2	1·1	3·2	56	93	2·0
Vest Gloucestershire C.D. ..	48,059	21·2	11·9	0·7	1·0	2·9	55	132	3·0
umfries County (landward) ..	43,808	24·0	14·3	1·0	1·2	1·9	—	—	3·8
oncaster R.D.	27,300	29·9	12·2	1·1	0·9	2·3	93	222	4·8
uildford R.D. .	20,090	17·5	11·4	0·7	1·5	1·5	33	111	0·0
tockton R.D. .	15,150	25·0	10·6	0·3	0·8	2·6	91	222	2·6
ridlington R.D.	8,154	18·6	12·0	0·4	1·0	1·9	32	136	6·8

C.D. = combined district. R.D. = rural district.

Hertfordshire.

Dr. H. Hyslop Thomson states that special efforts re made to deal with all open cases of tuberculosis insanitary areas or in unhealthy or overcrowded ouses. The opening of the County Sanatorium at Vare Park, with accommodation for 130, marks an nportant stage in the council's scheme. The absence adequate accommodation for low-grade and comlicated cases of mental defect is seriously felt from me to time. The need for a few efficient small-pox ospitals to take the place of the large number of xisting small hospitals, many of which are of indifferent onstruction, is pointed out. Provision for the supply diphtheria antitoxin is only made by about half the 34 districts. The educational work of the centres" has brought about a reduction in bottleeding, and the decline in notified cases of ophthalmia eonatorum is claimed to be the result of the use of lloidal silver by the midwives.

Dr. Thomson again complains of the dumps of nported refuse. The Ministry of Health has suggested les to be observed by dumping authorities, but legistion will be needed to give the county council power enforce these rules. One improvement has been ought about by the Ministry—namely, that railway agons conveying refuse are required to be covered. he question is : Has any sanitary authority a right create a dump for offensive refuse in the district another sanitary authority, and has not sanitary ience advanced sufficiently to enable us to say that ese offensive refuse dumps are unnecessary ? The rification of our rivers has cost money but has been orth it. We think the abolition of offensive refuse umps will also be worth the cost.

Herefordshire.

Dr. Herbert Jones complains that the district councils not take the water-supply of the houses in their stricts seriously. About one-quarter of the cottage uses are supplied from sources at a distance and any dip wells which could be rendered safe are not ndered safe. It is also quite common to build a new ttage before ascertaining whether there is any suitle water-supply available. Dr. Jones has no mpathy with any occupier who complains that his il closet is a nuisance. The remedy is in his own nds—viz., to see that a supply of earth is provided d used. There is a great improvement in the sanitary arrangements of the licensed houses. A few years ago it would have been difficult to find a house where one could recommend a fisherman or tourist to stay for a week-end. Now there are many comfortable country inns with sanitary conditions equal to those in towns.

Owing to the cost of repairs, routine house inspection has been in abeyance. Dr. Jones recommends that it be resumed. Thirty-six new houses were completed during the year. The accommodation for hop-pickers has been greatly improved in those districts in which by-laws are in force. Of the six rural districts in the combined district, one does not import hop-pickers but five do. Of the five councils of the districts which need to import hop-pickers, three have adopted by-laws but two have not. Dr. Jones points out that many of the hop-growers are anxious to make the pickers comfortable and that it is unfair to them that other growers do not "toe the line." The by-laws are not exacting, and one hopes that before the next report is issued the two reluctant rural district councils will have adopted them.

West Gloucestershire.

Surg.-Captain O. W. Andrews reports that the new reservoir on Ruardean Hill, the highest point in the Forest of Dean, has been completed, and that improved machinery for deep well pumping is being established at Greenbottom and will be ready for use next summer. Further extensions proposed will, it is hoped, provide a satisfactory supply for the whole of East Dean. An unusual incident is reported in the sudden disappearance of the water in three wells supplying the residents of Plump Hill Ward, East Dean. Earthquake disturbance could apparently be excluded, and it is suggested that the occurrence is due to the driving of an adit by an iron ore company under the area affected. There is a good spring in the neighbourhood, and it is suggested that this should be used to supply a ram capable of pumping the water to a reservoir on high ground, from which the whole district can be supplied at small cost. Dr. G. F. Rigden, the medical officer of the Cinderford Mothers' Club and Babies' Welcome, referring to industrial depression, says there are not an unusually large number of cases of malnutrition, but that he has been many times struck by the evident signs of under-nourishment in the mother of a well-nourished child.

Dumfries County.

Dr. J. Maxwell Ross reports that there were 936 legitimate and 116 illegitimate births in the County Landward. The mortality is not given for legitimate and illegitimate infants separately. The total rate per 1000 births was 85, the male rate being 97 and the female 71. Dr. Ross reviews the tuberculosis scheme ; 27 shelters are available for use throughout the county. Sanatorium accommodation is very limited, especially for surgical tuberculosis cases, which need such prolonged treatment and for whom successful domiciliary treatment is impossible. The disposal of sewage by the burghs and special drainage districts is not yet satisfactory. In one case the difficulty is the cost to a village with a low rateable value. The pollution of the Nith by black water, apparently pumped from the coal-mines, and also by lead from Wanlockhead lead-mines has received attention. The question has arisen as to whether the former pollution can be dealt with under Section 5 of the Rivers Pollution Prevention Act, 1876.

Doncaster Rural.

Dr. A. B. Dunne reports marked building activity in five of the 37 parishes included in his district. The sinking of the shaft of the new colliery at Armthorpe has been actively carried on ; 472 new dwelling-houses and bungalows have been completed during the year.

Guildford Rural.

Dr. R. W. C. Pierce reports a considerable prevalence of influenza in the early part of the year and that schools had to be closed for this cause. The new slaughter-house by-laws have come into force and make provision for the humane method of slaughter. The 112 new houses completed during the year include 50 erected in Artington parish by Onslow Village, Ltd., now absorbed into the borough.

Stockton Rural.

Dr. Thomas J. Kirk reports a slight influenza epidemic in the last month of 1921 and the first month of 1922. The number of new houses completed during the year was 96, all by private enterprise.

Bridlington Rural.

Dr. William A. Wetwan reports that a few houses have been built but not enough to warrant turning out the occupants of 40 to 50 dilapidated dwellings and putting pressure on the owners of many more to bring them up to date. This is Dr. Wetwan's farewell report after 31 years' service, and he makes reference to the sanitary improvements which have taken place in the district during that period.

SCHOOL MEDICAL SERVICE.

Bristol.

LAST year 28,132 children were medically examined; 16,248 of these were routine, and 11,884 special inspections. Of the 1165 children suffering from enlarged tonsils and adenoids, 984 were recommended for treatment. 497 new cases were examined at the tuberculosis dispensary, and of these 57 were classified as definite pulmonary tuberculosis, 212 as cases of involvement of the hilar glands, &c., 20 as suspected tuberculosis, 208 as non-tuberculous. There were 295 cases of scabies, 2358 of impetigo, and 418 of ringworm of the scalp dealt with during the year; 183 of the ringworm cases were carried over from last year. Most of the 1050 cases of external eye disease occurred amongst debilitated children from the poorer homes. Attendances at school clinics during the year amounted to 172,487. A campaign was initiated in 1921 against verminous conditions. The coöperation of teachers, health visitors, infant welfare centres, schools for mothers, Sunday schools, boards of guardians was enlisted. Dr. R. A. Askins reports that a very great amount of good has resulted. He considers that if public interest can be kept stimulated in this problem we may soon see this evil reduced to such dimensions as to make its final extinction possible. Open-air classes are held in three city parks, each class accommodating 25 children. In wet weather the bandstands, protected by canvas wind-screens, are utilised, and the attendance at these classes rarely drops below 90 per cent.

Colchester.

The total number of children examined under the routine group was 2134, and 47·2 of these had defects requiring treatment or further observation; cases of uncleanliness or dental defects are not included. The number of children with defects is lower than that of the previous year, and Dr. W. F. Corfield observes that there appears to be only one reason to account for this—"the surplus of defects that had become chronic during the war and also the cases of malnutrition and debility resulting therefrom have now been overtaken, and the above figures are somewhat about a normal return." But surely the remarkable effect of the war on school statistics all over the country was the decrease in the number of cases of malnutrition and the feeding cases. The class for stammerers held last year has not yet been resumed, and the children returned to their ordinary schools. The teacher in charge of the class visited these schools and reported on the condition of the children. Of the 37 who attended the classes, two left the town and ten left school. The head teachers, with one exception, agreed as to the great improvement in speech effected by the classes, and an effort is made to keep up the practice of voice exercises. Of the 1580 children referred for treatment, 728, or less than half, actually received treatment.

At present little attempt is made to encourage parents to send or bring children to the dental clinic, as the dentist has his time fully occupied with those who come without such pressure. The medical officer suggests two methods by which this lack of interest could be stimulated: (1) the services of the dentist be secured for an extra half day a week; and (2) a dental dresser be employed to help the dentist. As it is, the dentist was employed on fewer occasions during 1922 than 1921, and we would suggest that in medical treatment of school-children, as in everything else, the demand creates the supply rather than vice versa. In this borough the demand appears to require energetic stimulating.

Swindon.

Altogether 3697 inspections were made. Of the 2673 children examined in the routine group, 45 suffered from malnutrition, 73 from defective hearing, 2 from otitis media, 55 from other ear affections, 13 from scabies, and 25 from speech defect. During the year there were 227 cases of ringworm, which has been prevalent in Swindon for many years. The work of stamping out this disease is now well in hand, and at the end of the year there were only 23 cases in an infectious condition, and every case was under treatment.

The prevalence of thyroid enlargement in Swindon led to the establishing of a clinic to deal with this affection, and Dr. Dunstan Brewer reports on the result of a year's treatment of those cases who were handicapped either by the appearance of the enlargement or by symptoms of disordered thyroid action. At first the cases were treated by simply painting the neck with tincture of iodine, and a definite improvement in these cases is recorded. On the assumption that the improvement was not due to any local action but to the absorption of iodine, a second batch of cases were painted under the armpits instead of on the neck. A more rapid improvement is recorded in such cases. A third batch was treated with iodide of potassium given internally with no apparent improvement of any description. Collosol iodine given internally proved to act better than any other treatment, and is now the standard method employed. The statement in the report that methods of treating stammering and similar defects of speech at present available in this country are of no practical utility, as they entail a cost which neither parents nor ratepayers are prepared to face, is surely inaccurate. We would refer Dr. Brewer to the six London County Council clinics for such treatment, which have been doing excellent work in this direction for the last two years, and can certainly not be called expensive.

THE PASTEURISATION OF MILK.

A REPORT BY THE MINISTRY OF HEALTH.

IN a recent report which constitutes one of the Ministry of Health series of reports on public health and medical subjects, Dr. J. M. Hamill[1] gives a brief account of the nature and object of pasteurisation, and the part which it may legitimately play in securing a safe and satisfactory milk-supply. His notes are also intended to serve as a guide to local authorities and others in respect of essential requirements in the design and construction of pasteurising appliances which should be complied with in order to satisfy the provisions of the Milk (Special Designations) Order, 1923, in regard to pasteurised milk.

Definition.

At the outset Dr. Hamill defines the object of the pasteurisation of milk as the destruction by heat of pathogenic organisms, and the reduction of the number of other organisms, especially those which cause milk to go sour, without appreciable alteration of the physical and chemical characters of the milk. When milk is heated to a relatively high temperature such, for instance, as 175° F. to 212° F. pathogenic organisms may or may not be destroyed, according to the actual temperature attained and the duration of exposure of the milk to it ; in any case the physical and chemical properties of the milk undergo considerable alteration as a result of such treatment, and from a commercial point of view the quality and saleability of the milk is impaired. It is also possible that from a nutritive point of view such milk is less desirable than milk not so treated. Experience has shown that exposure of milk to a temperature between 145° F. and 150° F. for 30 minutes, if carried out with due attention to detail, destroys virtually any pathogenic organisms present in the milk without producing appreciable change in its physical and chemical characters. From the public health point of view, therefore, where milk is concerned, the term " pasteurisation " should be confined to the process of heating to not less than 145° F. and not more than 150° F. for a period of 30 minutes. Dr. Hamill uses the term strictly in this sense.

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[1] Reports on Public Health and Medical Subjects. No. 17: Notes on the Pasteurisation of Milk. By J. M. Hamill, M.D., D.Sc., Medical Officer of the Ministry of Health. 1923. 2*d.*

Effect of Pasteurisation on Bacterial Content of Milk and on its Chemical and Physical Characters.

Amongst the pathogenic organisms with which milk may be accidentally contaminated are *B. tuberculosis*, *B. diphtheriæ*, *B. dysentericus*, *B. typhosus* and other organisms of the typhoid-paratyphoid group. All the above organisms are destroyed by pasteurisation ; the virus of foot-and-mouth disease is also destroyed, and although a small proportion of tubercle bacilli may, under certain conditions, escape actual destruction, their virulence appears to be so impaired as to make them harmless. Certain strains of streptococci may also survive pasteurisation, but the streptococci believed to be responsible for septic sore throat are destroyed by the process. Pasteurisation, therefore, renders milk reasonably safe as regards risk of transmitting disease. But apart from pathogenic bacteria milk always contains a number of non-pathogenic bacteria which gain access from the hands of milkers, from particles of manure, from dust and dirty utensils, etc. The number of these bacteria, quite apart from their pathogenicity, indicates the care bestowed upon its production and handling. Dirty milk is, of course, more likely to contain pathogenic bacteria. A proportion of the non-pathogenic bacteria are sporing organisms ; amongst them are lactic acid bacteria which produce lactic acid during their growth and cause the souring of milk.

Pasteurisation does not destroy the whole of the non-pathogenic organisms in milk, but may reduce their number by as much as 99 per cent. As a general rule it may be said that the number of bacteria after pasteurisation is greater in milk which contained a large number of bacteria before pasteurisation than in milk which originally contained relatively few bacteria. Thus the bacterial content of pasteurised milk affords an indication of the bacterial condition of the milk before pasteurisation.

When milk is properly pasteurised the majority of its chemical and physical characters show no appreciable change. The taste and flavour are hardly at all altered ; alteration in the taste of the milk may depend, to some extent at any rate, upon exposure of the milk to air at the pasteurising temperature—in other words, oxidation may play a part in the change. If this be so the desirability of avoiding so far as possible exposure of milk to air during pasteurisation is obvious. If ordinary raw milk is allowed to stand, the cream gradually rises to the top and a line of demarcation, the " cream line," appears between the cream and the remainder of the milk. In milk pasteurised at 145° F. for 30 minutes the cream line is hardly if at all affected, but above that temperature the cream rises slowly and imperfectly, and in milk pasteurised at a temperature of 148° F. the cream line may be decreased by 40 per cent. From a commercial point of view the integrity of the cream line is important, because consumers are apt to look askance at milk in which the cream line is poor. In milk pasteurised at 145° F. for 30 minutes no appreciable change takes place in the milk proteins ; if, however, the temperature is raised to 150° F. for 30 minutes a small proportion (about 5 per cent.) of the milk albumin is rendered insoluble. Coagulation by rennin occurs slightly more rapidly in pasteurised than in raw milk. The soluble calcium and magnesium phosphates of the milk do not become insoluble or separate out when milk is pasteurised at a temperature of 145° F. for 30 minutes. This treatment has, furthermore, only a slight effect upon the enzymes which are present in milk.

The effect of pasteurisation on the vitamins in milk is important. Milk is rich in fat-soluble A vitamin and also contains water-soluble B vitamin and the antiscorbutic vitamin (or C vitamin). Both fat-soluble A vitamin and water-soluble B vitamin have a relatively high resistance to heat, so that pasteurisation has practically no effect upon them. The antiscorbutic vitamin, however, is sensitive to heat above 122° F. and there seems to be little doubt that pasteurisation at 145° F. for 30 minutes weakens the antiscorbutic property of milk. The destruction of vitamins appears to be due to oxidation and is accelerated in the presence of air. Any precautions taken in pasteurisation to exclude air with the object of preventing changes in taste and flavour would also act beneficially in safeguarding the vitamins.

Some Considerations in Regard to Pasteurisation.

In general it is desirable that food should be consumed in its natural fresh condition whenever possible, but in densely populated areas the circumstances are often such that, unless perishable food like milk can have its keeping qualities improved by some process which does not appreciably alter its properties or impair its nutritive value, a proportion of the population will be forced to curtail or even do without a very important food.

An ideal milk-supply, obtained from perfectly healthy cows under the cleanest conditions and consumed immediately with the least possible manipulation or handling, is difficult of attainment. Milk of this high quality must necessarily be limited in amount and its cost precludes its use by the average consumer. As England is a highly urbanised country, much of the milk-supply has to be transported considerable distances, a circumstance unfavourable to its keeping qualities and often resulting in considerable loss of milk by souring. Pasteurisation may be regarded as a factor in the extension of the consumption of milk by urban dwellers, many of whom at the present time do not consume as much milk as they should. Pasteurised milk is, of course, just as liable to bacterial contamination as clean raw milk, and since it still contains some lactic acid producing organisms it will eventually go sour just as does clean raw milk. It is essential, therefore, that it should be thoroughly cooled immediately after pasteurisation and kept under good conditions until consumed.

It is sometimes asserted that bacteria grow faster in pasteurised than in raw milk. Experimental evidence, however, does not bear this out, but goes to show that the rate of bacterial increase is approximately the same in raw and pasteurised milk when comparison is made between milks having about the same bacterial content. It is also alleged that pasteurisation will not encourage farmers to exercise cleanliness in production of milk, and will enable dirty and stale milk, otherwise unfit for sale, to be placed on the market. But the keeping qualities of pasteurised clean milk are superior to those of dirty milk after pasteurisation. It is, of course, possible to prolong the life of pasteurised milk by repasteurisation, but this process would permit deviations from the normal to an extent which is undesirable.

It is occasionally stated that pasteurised milk does not agree with all children, but the same may be said of any milk ; extensive experience of feeding children on pasteurised milk goes to show that it is as well borne by them as raw milk, and, except in regard to antiscorbutics, it appears to be equally nutritious.

Appliances Employed in Commercial Pasteurisation.

A pasteuriser should be moderate in cost, reliable, efficient, simple, compact, durable, easily kept clean, easily operated, and, in addition, continuous in action. A large variety of appliances continuous in action have been devised for commercial pasteurisation. They can conveniently be grouped into four categories or types.

1. "*Flash*" *Pasteurisers.*—"Flash" pasteurisation is a process in which the milk is very rapidly heated to a relatively high temperature and then cooled. In one type of flash pasteuriser the milk enters a hollow vertical cylinder at its lower end and by means of a rotating device is distributed by centrifugal force in a thin film over the inner surface of the cylinder and then leaves the cylinder at its upper end. The cylinder, and therefore the milk flowing over its inner surface, is heated by a combined water and steam jacket. The apparatus is continuous in action. This type of pasteuriser has many serious disadvantages. It is very difficult to maintain a uniform temperature, and the relatively small heating area makes it necessary to raise the temperature of the heating medium considerably higher than the temperature to which it is desired to raise the milk. This means overheating of portions of the milk and alteration of its character. Again, the milk is not retained sufficiently long at the pasteurising temperature and portions of the milk may not reach that temperature. It is impossible by means of a "flash" pasteuriser to ensure the definite results aimed at in pasteurisation.

2. "*Retarders.*"—The many varieties of design in this class of pasteuriser agree in the general principle of allowing the milk to pass through an apparatus so constructed as to delay or retard the flow of the milk and thus keep it at the pasteurising temperature for a prolonged period. All retarders are continuous in action. Retardation may be effected by various devices, such as compelling the milk to take a long course through a series of tubes or through chambers fitted with baffle plates. Where it is required that milk shall be exposed to the pasteurising temperature for 30 minutes the apparatus is so designed that a volume of milk equal to the capacity of the apparatus passes through it in that time.

Retarders possess many commercial advantages—simple design, close control of temperature, &c., but for complete destruction of pathogenic organisms retarders cannot be relied upon, as no retarding system yet designed is able to prevent a portion of the entering milk from passing through in less than the prescribed time.

3. "*Holder*" *Pasteurisers.*—The term "retarder" is sometimes used to describe pasteurisers of this class. It is desirable to restrict the term "retarder," however, to appliances of the type described above. The "holder" class of pasteuriser has for its object the elimination of the defect which retarders possess of allowing a portion of the milk which passes through them to escape too soon. It is the practice commercially to classify holder pasteurisers into two groups, according to whether the milk is heated in the holder itself or before entering the holder. The underlying principle of holding all the milk at a definite temperature for a definite time is the same in both groups. The simplest form of holder is a tank in which the milk is kept or "held" at 145–150° F. for 30 minutes and then cooled. Holders of this type having a capacity of 50 to 100 gallons are made for dairymen doing a limited trade in pasteurised milk. The holder is conveniently a cylindrical tank surrounded with a water jacket into which steam can be admitted to heat the milk, and an agitator is provided in the holder to facilitate the heating of the milk. The temperature in the jacket is raised slightly above the pasteurising temperature by the admission of steam into the water, and when the milk in the tank reaches the pasteurising temperature the steam is cut off and the milk kept in the holder for 30 minutes, when it is cooled by a flow of cold water through the jacket. Alternatively, the milk may be heated before admission to the holder and cooled in a separate cooler after being held at 145–150° F. for 30 minutes. This simple type of holder is effective, but is not continuous in action; for work on a large scale continuous action is a commercial necessity, and the simplest way in which this can be attained is by using three separate holding tanks of the same capacity. Milk is held in one tank at the pasteurising temperature for 30 minutes, whilst the second tank is being filled and the third emptied. The milk in the second tank is then held for 30 minutes whilst the first tank is being emptied and the third filled; in this way a continuous cycle of filling, holding, and emptying is achieved. The use of only three tanks, however, is open to the objection that some of the milk may be held for much longer than 30 minutes, and that one hour must elapse after the commencement of work before pasteurised milk can be obtained. These drawbacks can be minimised by increasing the number of tanks and so enabling the period of filling and emptying each to be diminished.

To enable the process of pasteurisation to be adequately controlled and supervised, it is desirable that all pasteurisers should be fitted with some form of automatic time-temperature recorder, whereby the temperature of the milk during the process of pasteurisation in relation to the time taken is continuously recorded on a chart. A permanent record of this kind is of value to the milk vendor and to those in charge of administration as a check on the proper working of the pasteuriser.

4. *Pasteurisation of Milk in Bottles.*—The advantages claimed for the pasteurisation of milk in airtight stoppered bottles are that the milk cannot become contaminated after pasteurisation and before use, and that it keeps longer than milk pasteurised in bulk. An apparatus for pasteurising milk in bottles cannot be regarded as satisfactory unless it can readily comply with the following requirements. It must be possible to ensure that the milk reaches the pasteurising temperature and is not heated above this temperature (145–150° F.), and in addition, there must be practicable means for ascertaining definitely that the milk has been kept at the pasteurising temperature for 30 minutes.

As regards the first requirement, the temperature of the heating medium (usually water heated by steam) may be considerably above the pasteurising temperature, and there are obvious difficulties in making certain that the bottled milk, the temperature of which cannot be measured directly, has attained and not exceeded the pasteurising temperature. Similar considerations apply to the second requirement. It is not a simple matter to ascertain the period during which the milk has been kept at the pasteurising temperature in the case of milk in bottles, where direct temperature measurement is impossible. The matter is complicated by the period, not easily estimated, during which the temperature of the milk in the bottle lags behind that of the heating medium. In any particular apparatus this period of lag might be ascertained experimentally, and possibly an apparatus could be designed in which it would be small, but for purposes of control and supervision a method in which the period of exposure to the pasteurising temperature can only be determined indirectly is not so satisfactory as methods in which direct observation is possible. Uncertainty could be avoided by first heating the milk in bulk up to the pasteurising temperature, and then filling the bottles already heated to the same temperature and keeping them at that temperature in the pasteuriser for 30 minutes. This method would be similar in principle to that employed in the "holder" process for milk in bulk.

DONATIONS AND BEQUESTS.—The late Mrs. Fredericke Mond, of Regent's Park, London, widow of Dr. Ludwig Mond, left to all the charitable societies or institutions to which she had been an annual subscriber for at least two years before her death a legacy, free of duty, equal to the aggregate amount of her annual subscriptions for the last eight years.

THE LANCET.

LONDON: SATURDAY, AUGUST 18, 1923.

LONDON WATER.

THE Metropolitan Water Board supplies 35 gallons water a day for the use of each of nearly seven llion persons scattered over 537 square miles and counties, water which is fit not only to wash and sh, but to drink; and this immense task is rried out with such apparent ease and regularity at the Londoner, when he travels, begins to realise the first time that water may be scanty or brackish insipid or discoloured. It was only during the eat drought of 1921 that the inhabitants of the etropolis began to think seriously at all of their ter-supply, and Sir ALEXANDER HOUSTON, director water examination to the Board, in his seventeenth nual report just published,[1] endeavours to keep alive is new and wholesome interest by describing the nders of London's water-supply in language as free m technicalities as is reasonably possible. The mplete protection of London from water-borne ease is the more remarkable inasmuch as 80 per nt. of the water is drawn from two rivers which undeniably polluted. Less than 20 per cent. mes from the deep wells in Kent and in the a valley, whose water is bright, clear and arkling, and pleasant to taste, while its undoubted rdness is not prejudicial to health although prodigal the use of soap. Its reputation for purity is nost a danger, apt, as it is, to create a feeling of plicit trust, and during the drought of 1921 the ptford "twins" well fell off so greatly in quality to require chlorination. Another well, that at altham Abbey, supplies water which, although very re bacteriologically, contains iron and sulphuretted drogen, which need to be eliminated. Although ndon well water bears such a small proportion to the ole, we are reminded that it would abundantly oply a city of the size of Birmingham.

Pollution of the river water-supply is not a fixed necessarily permanent quality. The Thames used be a great salmon river, and might be so again re it not for the effluents draining into the tidal rtion. Salmon could now thrive and spawn in the er above Teddington weir, although they cannot e the ordeal of ascending the lower reaches, and upper Thames as it is possesses great powers of uperation, for the surface water is constantly being lenished by underground springs, and during the nmer months many of the existing pollutions se to reach it direct. Investigations made 15 years showed the water at Hampton to be not greatly erior to that 55 miles higher up, the difference being slight as to suggest that in spite of fresh pollutions river is not deteriorating to any progressively rked extent along its flow. Next year the total acity of the Thames storage will be doubled on the npletion of the great reservoir at Littleton. Storage one of Nature's own methods of purification, by ich not only do the solid impurities settle and ance pollutions become greatly diluted, but pathoic bacteria gradually lose their vitality and die ring the passage of water through the reservoirs. d these reservoirs are so enormous—taken together eeding Ullswater in surface—that to all intents and purposes Londoners are really drinking lake water. Economy alone has led to the chlorination of raw Thames water in the aqueduct at Staines, by which a certain amount of additional pumping is avoided, and this chlorination has been carried out without giving rise to a single complaint of taste among the two million persons who drink it.

The Lea valley supply has peculiar interest, derived as it is largely from the New River, an artificial channel nearly 30 miles in length, with its intake safely above the Hertford sewage works. This rivulet is practically free from pollutions along its whole course, but has troubles of its own, for in the spring of each year abundant growths, chiefly of diatoms, develop to such an extent as to block the filters, and while such algicidal agents as chlorine or copper sulphate have been sometimes effective in the reservoirs, no panacea has yet been discovered for the prevention of algal troubles. New River water is continuously diluted as it flows with pure well water, and its volume would suffice to supply such a town as Liverpool or Manchester. Sir ALEXANDER HOUSTON is rightly proud of the results of the water examination which he directs, but his pæan of praise for the present supply is not, as he cannily remarks, to prejudice him in calling attention now or hereafter to any imperfections which may be found in the quality of the water. With whatever care and foresight, the water expert cannot discover all the hidden dangers to which a water-supply of this magnitude may be exposed. Safety lies in not introducing any new factor into waterworks procedure until it has the hall-mark of bacteriological approval, and in safeguarding the finally purified water against the entrance of impurities. The coöperation of the public is needed to achieve the second of these objects, and such a report as the one before us should help in forming and instructing public opinion. Let every good citizen read it.

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THE TREATMENT OF INFECTIONS OF THE HANDS.

IT would have been difficult to select a subject of more general interest than the treatment of infections of the hand, which was discussed at the annual meeting of the British Medical Association at Portsmouth. For this reason we gave last week an unusually long report of this session of the Surgical Section. It is probably within the mark to state that five-sixths of the adult working population follow some calling for the proper performance of which the integrity of their hands is a necessity. The importance of skilful initial treatment when these infections occur can scarcely be overestimated, for although the loss of one finger in itself may not interfere seriously with a man's occupation, when such an amputation must be resorted to the inflammatory process has too frequently spread to the palm, with the result that the grip of the hand or the movements of the other fingers are seriously impaired. In some hospitals the treatment of these patients from time immemorial has been relegated to the junior staff. The outcome of this policy has been that little interest has been taken in improving therapeutic technique, and a generation of practitioners has grown up trained in methods which are now obsolete.

It was left to KANAVEL in America to reinvestigate this subject and to infuse new life into it. The results of his labour were finally embodied in a monograph which will assuredly remain a classic upon which future treatment will be based. Although much of KANAVEL's work was published more than ten years ago, his teaching has not yet reached the majority of

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London: P. S. King and Son, Ltd., 2, Great Smith-street, stminster. 15*s.*

general practitioners, so that we still see patients who have suffered from the commonest of all hand infections, that of the pulp of the finger, crippled by an ill-chosen median incision. Either there remains a scar too sensitive to pressure for use, or deforming scar-tissue has destroyed the delicate tactile sensibility of the pulp. Early lateral incisions are just as effective in checking the infective process without these drawbacks. The unsightly nails we still see after the healing of a whitlow result from delay in removing the nail and the unnecessary incision of the matrix. When the infection has reached the tendon sheath the prognosis as regards future mobility is rather poor, for the tendon is very likely to slough or form such adhesions that it becomes immovably fixed, whilst extension to an interphalangeal joint will almost certainly lead to a stiff finger. Here early lateral incisions are essential, but though they may pass with advantage through the subcutaneous tissue along the whole length of the finger, the sheath should only be opened opposite the shafts of the phalanges, or a troublesome prolapse of the flexor tendons will occur. The after-treatment of these thecal whitlows is exceedingly difficult and an issue with good movement is the exception rather than the rule. Sir Henry Gray's recommendation that Willems's mobilisation treatment should be instituted from the first deserves attention. After the incision the patient must be encouraged, threatened, or cajoled into active movements whilst his hand remains in a bath of weak antiseptic or saline solution. Passive movements are wrong and do harm. Drainage by this method is good. Tubes, gauze, or rubber tissue drains are seldom necessary. The worst of all infections are those which travel up from the thumb or little finger to the anterior carpal sheath. The operative treatment of this condition is a major surgical procedure and should always be carried out very deliberately under general anæsthesia, with a tourniquet applied. The areas of infection must be reached by the proper anatomical route, injury to the nerves and vessels of the palm being sedulously avoided. Even with the greatest care, the infective process may spread to the fascial planes of the forearm, and the general condition of the patient be so grave that an amputation becomes the only life-saving operation.

Mr. D. P. D. Wilkie called attention to those streptococcal infections which show such a great tendency to generalisation. With a non-suppurative limited area of infection in the hand are associated a lymphangitis up the arm, an axillary adenitis, and septicæmic symptoms. Early incision is not indicated in this condition, the principles of treatment being to aid the general resistive powers of the body, encourage elimination, and locally to institute Bier's hyperæmia.

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DOCTORS AND UNCERTIFIED MIDWIVES.

A case of some interest, decided earlier in the year but only lately appearing in the Law Reports, throws light on the amount of supervision which a doctor should exercise over a woman who acts as a midwife without being certificated. The Midwives Act of 1902 declares that, if a woman is not certified under the Act, she commits an offence punishable by fine if she "habitually and for gain" attends women in childbirth "otherwise than under the direction of a qualified medical practitioner." An exception is made for emergencies, but in the case to which we draw attention (Davis v. Morris, *Law Times Reports*, vol. cxxix., p. 88) there was no suggestion of an emergency. The facts were that five expectant mothers had engaged an uncertified midwife's services; qualified medical practitioners were also retained in each case, but they did not pay any professional visits until after the confinements which were attended by the woman alone. In these circumstances she was prosecuted under the section. The doctors who had been retained came and gave evidence on her behalf. They said she was in their opinion capable and trustworthy; they had given her no specific instructions; it was unnecessary to do so; she was acting, they said, under their direction in attending the confinements. The magistrates had to consider whether this was sufficient supervision under the Act, or whether "direction" did not mean special instructions suitable to the particular case. They came to the conclusion that no offence had been committed and they dismissed the prosecution. It turns out, however, that they were wrong. The Lord Chief Justice pointed out that in no case was there any professional visit by the doctor; in no case was there any professional inquiry or any specific instruction. There was thus no evidence on which the magistrates could find that there had been any direction at all. Direction must be real and not nominal. "The medical practitioner should accept more than the nominal responsibility for the case. He must make himself acquainted with the particular requirements of the patient. It is not enough that there should be a qualified figure-head in the background; the unqualified person must be acting under the real direction of a medical practitioner."

This judicial homily deals, we take it, not so much with the abstract standard of doctors' conduct as with the conditions necessary to be established in a court of law if an uncertified midwife is to be found not guilty of an offence against the Act. But as there is no statutory definition of "direction," the decision is valuable. It is only fair to add that the woman whose action was in question had formerly been a certified midwife, but her certificate had been withdrawn. In the eye of the law she may have been uncertified and unqualified, but the skill and experience which in time past had been sufficient to earn her certification were, doubtless, well known to the doctors under whom—if not under whose "direction"—she was serving.

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ALTERATIONS OF VIRULENCE BY PASSAGE.

It is commonly held—and on sound experimental grounds—that when a dose of many millions of bacteria is given to an animal the great majority of the organisms are soon killed and disposed of, and that fatal infection, if it occurs, is due to the survival and multiplication of the relatively infrequent individuals which are able to withstand the attempts of the animal to destroy them. If after the death of the first animal this new race of exalted virulence is inoculated into a second host a similar selection occurs, and so on through successive animals until the capacity of resisting the mammalian body, in other words the virulence, of the organism has by this selective breeding been developed to the highest possible degree. Whether the mean virulence of the race which is finally obtained is greater than that of the most virulent individual of the original inoculum is unknown, but if there is any such progress in absolute individual virulence selective breeding seems to be the basis of this pasteurian exaltation of virulence by passage. It seems likely, too, that the same process goes on during the course of a natural epidemic. Several experimental observations have, however, lately been made which indicate that this is not always the sequence of events.

Prof. C. H. Browning and Miss R. Gulbransen[1] noticed that very small doses of pneumococci, which n large quantities were rapidly fatal, might set up a chronic pneumococcal septicæmia in mice lasting at least several weeks, during which time the organisms can hardly have been engaged in selective breeding for virulence. The results in this instance may have been due to the original dose having been only a small sample of the pneumococcus population which by random sampling did not happen to contain any highly virulent individuals. If that were the explanation, the experiment would not come off every time, for some of the samples would include the most virulent cocci. The same authors[2] later pointed out that the virulence of the pneumococci present in the heart's blood of a mouse dying within 48 hours of inoculation may be actually less than those inoculated into the animal, and they have recorded a similar loss of virulence in fatal infections of mice with tubercle bacilli. Dr. W. MAIR[3] also records some very significant observations. Rabbits received a prolonged course of inoculation with dead pneumococci and their serum protected mice against many fatal doses of live organisms. The animals hen received doses of living pneumococci; after some months they deteriorated in general health, and on examination were found to have a pneumococcus septicæmia with extensive vegetations on the heart valves, reproducing broadly the picture of chronic infective endocarditis in man. The organisms isolated rom the blood proved to have lost their virulence for rabbits and mice in the sense that large doses no onger caused acute death. Dr. F. GRIFFITH[4] has also shown that these results may be reproduced in vitro. By growing pneumococci in their own immune serum he finds that a fresh race develops with different cultural characters, resistant to agglutination (as in Dr. E. W. A. WALKER'S classical experiments with typhoid bacilli[5]), impotent as antigen, and with a marked loss of virulence. These modifications suggest hat the organism has been selected into a form which to a large extent fails to interact with the host, which is "naturally" immune to it to a certain degree, and which will set up local changes only in such places as the avascular heart valves, where the normal mechanism of response and resistance is defective. It is of much interest in this connexion to recall that Sir THOMAS LEWIS and his collaborators have lately shown[6] that the incidence of chronic infective endocarditis in man is largely determined by the occurrence of small congenital valvular defects.

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[1] Journal of Pathology and Bacteriology, 1923, xxvi., 122.

There are evidently here a series of instances where bacteria will live for a long time in the body, and may cause death, without on the one hand being destroyed by phagocytosis or other defensive mechanism, or on the other reaching an exalted virulence by a process of selective breeding. No explanation of the phenomena is obvious, but it is plain that the facts are of importance and may open up a fruitful field of nquiry. "Virulence" may be too comprehensive a term, and it is possible that it should be dissected nto capacity to cause damage in the body and capacity to resist what the body does to destroy he parasite. Such a distinction was foreshadowed by Dr. W. W. C. TOPLEY in his Goulstonian lectures of 1918 on the Spread of Bacterial Infection. The pneumococci in Dr. MAIR'S rabbits, for example, have a considerable virulence in causing a particular ort of damage and a high virulence in escaping destruction. Which suggests that "virulence" of the first kind may require qualification in respect of different sorts of lesions, a view which finds support n the tissue and species specificity of many bacteria. Our knowledge of the relations between host and parasite is derived mostly from the observation of acute infections; it may well require re-examination n respect of chronic fatal conditions, such as infective ndocarditis.

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[2] Ibid., p. 428. [3] Ibid., p. 426.
[4] Reports on Public Health and Medical Subjects, No. 18, Ministry of Health, 1923.
[5] Journal of Pathology and Bacteriology, 1903, viii., 34.
[6] Heart, July, 1923.

Annotations.

"Ne quid nimis."

PROF. LEONARDO BIANCHI ON OLD AGE.

Leonardo Bianchi, the great master of Italian neuropathology and psychiatry, is this year relinquishing the professorial chair at the University of Naples to the profound regret of his colleagues and students. Prof. Bianchi took for his farewell address[1] the subject of old age, perhaps in reference to the fact that his retirement was occasioned by the age limit, and it is characterised by much interesting material and apposite remarks. Life is regulated, says Prof. Bianchi, by laws of whose nature we are only partly cognisant. We do not know why certain individuals develop precociously, or why the germ of a great talent arrives at maturity only after a long time in the most diverse changes and circumstances of life—and he went on to draw an eloquent picture of old age as it might be, which we render in his own words:—

> How many men lay down their arms in life's struggle before reaching the age of 60! Without any more enthusiasm, or eagerness, or even a new thought or application, with no longer any artistic thrill, nor any ambition, not even a hymn to Life or to beautiful and generous Nature. Such men shut themselves in the spiral recesses of an inert habit. What is the reason why one man is degenerate at 60 years and another preserves his mental faculties at 85 or even 90 or more? There is no biological law which fixes the term when decadence of the mental life begins; there is nothing absolute in this matter. The absolute is found in human laws, often inspired by extraneous interests, associated with profound ignorance of the infinite resources of Nature. Meanwhile let us respect this law, our Duty. There is something which watches over individual interests, and that is Discipline. Obedience, in proportion as the social organism becomes more complex, is the greatest human virtue! Erect an altar to it and let it be your law.
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> As for myself, as long as I have strength and energy I will dedicate to you my whole thought. We were and are all enthusiasts of youth. I might almost say by occupation. Countless times it has incited my thoughts and rendered verdant year by year my existence with spring-like fertility. Living for several decades among you I have felt year by year the reflex of your spirit in myself, with the enthusiasms and generous impulses of youthful years, the hopes wooed by severe struggles, and the anxieties of work animated by an innate yet indefinite force which rendered even joyous the privations hidden under a chaste and sometimes painful gaiety. Youth must tend to become sublimated as it pushes forwards towards maturity and old age, which give force and experience to the prosperous life of the race.
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> Happy are they who reach without much travail or severe losses the extreme limit of life; and fortunate is the country where a lucid and cheerful longevity is not an isolated and exceptional phenomenon. And remember that the foundations of a strong old age are laid in the vernal years of life. Let me before taking leave of you give you this advice. Keep a part of your youthful energies for maturity and old age, whose activities are the right of the civilisation of the race. With all the respect due to certain researches on rejuvenation, do not delude yourselves as to the results. The rejuvenation of rats and fowls may be nothing else than a firefly for man; just as illusory as the vital sun that Brown-Séquard dreamt of as standing still in order to carry on victoriously the battle of life. The conception of Goethe will remain eternal as regards humanity, and the modern Mephistopheles, decked out by the laboratory experimenter, will in vain bring you an amorous Margherite if your vital balance results in a deficit in the years of youthful enthusiasm. Devote yourselves to the work of the community, and you will be very happy to feel yourselves even at the age of 75 useful to your country. This is my most fervid wish for you.

Prof. Bianchi cited many celebrated men whose mental vigour in old age was proverbial, such as Hobbes, Michelangelo, Kant, Verdi, and Cardarelli, and quoted the instance of Voltaire, who, two years after he had completed the tragedy "Irene," at the age of 83, wrote to a friend, a professor of philosophy, who had apprised him of his dyspeptic troubles: "Your stomach cannot be in a worse condition than my head; my little apoplectic attack at the age of 83 is quite on a par with the state of your bowels at the age of 40. Let us put my meninges and your intestines on the same dish and give them as an offering to Philosophy."

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[1] La Riforma Medica, xxxix., July 16th, 1923.

FAMILIAL RETINO-CEREBRAL DEGENERATION.

Since this condition was first described by the late Dr. F. E. Batten in 1903 a number of cases have been recorded, both of this disease and of the allied condition of familial macular degeneration without mental defect. An important article by Dr. W. H. Nardin and Dr. R. S. Cunningham appears in the June issue of the *American Journal of Ophthalmology*. In discussing the pathogeny of their cases the authors suggest a connexion with the previously described cases of amaurotic family idiocy, generally known by the names of their first describers, Tay-Sachs. All the cases, they suggest, may belong to one progressive type, with definitely decreasing malignity in character, depending on the time of onset of the symptoms.

> "Beginning with the Tay-Sachs type of amaurotic family idiocy, which commences early at 2 to 3 years of age and progresses very rapidly to a fatal termination, we have next in regard to the severity of progression the retino-cerebral degenerative type, the symptoms appearing at the period of second dentition, and finally those cases which, beginning later in life, from the fourteenth year on, show only changes in the retina. . . . It seems possible that the etiologic agent may be the same in these three groups, and the variability of the clinical syndrome the result of the differential resistance of the tissues at different ages."

This last suggestion is of considerable interest, and is well worth bearing in mind by those who have the opportunity of seeing these cases, which are not so uncommon as was once supposed. The present paper records five cases of the retino-cerebral type occurring in one childship of nine members. The age of onset was about seven; epilepsy and progressive impairment of vision, with pigmentation of the macula and progressive mental deterioration occurred. Complete blindness and imbecility followed, terminating with death.

VOLUNTARY AND POOR-LAW HOSPITALS.

Mr. Arthur Henderson, M.P., in a recent letter to the *Manchester Guardian*, pointed out that while thousands of patients are waiting for beds to become vacant in voluntary hospitals, many beds are empty in Poor-law infirmaries, and he called attention to the "serious disorganisation" of the public health service resulting from the distinction between the two types of institution. He referred to a hospital of 15 beds which had 300 patients on its waiting list, some of whom had been waiting for nearly a year; whilst in the Poor-law infirmaries 30,000 beds are said to be unoccupied, as a rule, in the summer months. This communication naturally led to inquiries being made as to the condition of affairs in Manchester and the adjoining districts, with the following results. It appears that at the Royal Infirmary, Manchester, alone over 1200 persons are waiting for admittance, while for all the Manchester hospitals there is an aggregate waiting list of about 4000; so that in Manchester about four would-be in-patients are competing for every vacant bed in the voluntary hospitals. Naturally the question of a pooling of bed accommodation between the Poor-law infirmaries and the voluntary hospitals has been raised. The matter is, however, not so simple as it appears. Whatever the number of vacant beds in the Poor-law institutions in and around London "in the summer months," investigation shows that, so far as Manchester is concerned, beds in the Poor-law infirmaries are filled up as completely as it is considered safe. Before the war the Manchester guardians added 100 beds every two years to meet the needs of the growing population, but this increase ceased during the war. An addition of 200 beds has now been sanctioned. When the number of sick persons chargeable to the Manchester Poor-law hospitals is compared with the total number of beds available—2500—in their institutions, there is only a very small margin of vacant beds; and, moreover, there are generally on an average of from 65 to 70 paying patients in these so-called "vacant" beds. It is stated that the guardians feel that the margin of accommodation at their disposal is so small that little good could possibly accrue from any system of closer coöperation. Much the same state of affairs obtains in Sheffield, which has 775 beds in its voluntary hospitals, while the waiting list numbers nearly 3000, and, moreover, there are very few spare beds in its Poor-law infirmaries; but a promising scheme has been evolved towards the joint control of voluntary and Poor-law hospitals. A Joint Hospital Council, on which the hospitals, the corporation, the boards of guardians, the University, the trade and labour council, and other interests are represented, has been set up and is working successfully. For a year this Council has made arrangements with the Ecclesall board for the reception of patients, paying a fixed rate per patient to the board. There are no "paying patients" in the ordinary sense of the term. To raise money to finance this scheme, it is stated that already over 160,000 of the workers of Sheffield contribute to the hospital scheme a penny out of every pound they earn, and thus become contributors with a direct financial interest in the hospitals, with free treatment therein—certain wards in the Poor-law infirmary being set aside for the use of voluntary hospital patients. By this scheme over £65,000 was raised last year. Over 1700 firms of employers collect the subscriptions, and add one-third to the workers' contributions. This year it is hoped to raise £90,000. A project is on foot to obtain land and buildings for the much-needed additional hospital accommodation, so that the necessary voluntary hospital service may be obtainable to meet present requirements as well as those necessitated by the increase of population.

MISTAKEN CHEST SIGNS.

The eighth fascicle[1] of Prof. J. Schwalbe's series of monographs on "Mistakes" is devoted to the diseases of the lungs and pleuræ, and is written by Prof. Hermann Schlesinger, of Vienna. If the rest of the series is as entertaining as this volume, there can be little doubt as to the success of its sale. It might be argued that studying mistakes is beginning at the wrong end, and that if the student were carefully taught to associate signs and symptoms with the corresponding morbid conditions there would be no mistakes. By the same token it might be argued that the rising generation should be encouraged to study the blameless lives of famous saints rather than the mottled careers of notorious criminals. But human nature being what it is, we are inclined to find more entertainment as well as instruction in the mistakes of others than in advice calculated to secure colourless perfection. On the subject of asthma alone Prof. Schlesinger is prolific in warning examples. One of the most simple and instructive signs of asthma is prolonged expiration, but the absence of this sign often fails to save the physician from himself and deter him from branding his patient as asthmatic. Eosinophilia is another useful sign of asthma which is frequently not sought, with the result that simple emphysema masquerades as true asthma. Even when asthma is correctly diagnosed it is often badly treated. Iodine and atropine are two of the most favourite remedies, and prescribed with discrimination each has its sphere of usefulness. But when potassium iodide gives no relief, and only provokes increased sneezing and coughing, to continue its exhibition is merely to risk drowning the patient in his own secretions. Yet physicians are apt to continue giving potassium iodide in such cases with a perseverance worthy of a better cause. Atropine also should be abandoned when large doses have been given for some time without benefit. As for the exhibition of adrenalin, it seems to be a veritable pitfall, and when it is given in cases of "cardiac asthma" with disease of the coronary arteries it may provoke severe angina and even death. Prof. Schlesinger appeals on behalf of the asthmatic to the specialist with a passion for progressively eroding the interior of the nose with the thermo-cautery in the benign hope that clearing the nasal passages will abort attacks of asthma. Such treatment may, indeed, do good. But, according to Prof. Schlesinger there are rhinologists who find something pathological in every nose, and whose furor operativus is never to be denied when asthmatics fall into their hands. One of the many lessons of this book of errors is that the best clue to obscure chest symptoms may be found well away from the chest, and that examination of the pupils may betray the tabetic origin of a persistent cough which for years has passed muster as an expression of bronchitis. To confess one's own mistakes is usually painful, but vicarious confession is a soothing avocation, giving joy to the confessor as well as to his audience. Even when it is robbed of its edge by anonymity, it can be made entertaining enough.

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[1] Leipzig: Georg Thieme. 1923. Pp. 152. 3*s.* 5*d.*

ACCIDENTAL SYPHILIS IN MEDICAL MEN.

Dr. C. L. P. Trüb,[1] of the University Dermatological Hospital in Bonn, has published a monograph on syphilis as an occupational disease in medical men. This work is frankly a compilation, and the editorial comment with which it is flavoured is of such a neutral and non-committal character that the book is little more than an expanded bibliography. But as such it is very useful and it is likely to prove a valuable work of reference; the more so because of the orderly arrangement and classification of the subjects under discussion. Accidental, extragenital syphilis in medical men is, alas, quite common, and Jonathan Hutchinson alone is said to have seen more than 100 such cases. Dr. Trüb has collected 669 cases from the literature, and it is obvious that this number must represent a mere fraction of the total; syphilis is not a disease which courts publicity. The statistics concerned with the site of the primary lesion show that the fingers, hands, and arms are the parts most frequently infected, and Dr. Trüb has assembled as many as 338 cases in which the chancre was situated in these positions. In another 32 cases the eyes, and in 12 the lips, were the first structures to be infected, and only in two cases was the chancre situated in a tonsil. It is curious to note how frequently medical men and students have deliberately contracted experimental syphilis. It is, perhaps, misleading to use the term "deliberate" in connexion with medical students whose knowledge of the risks they ran must have been far too incomplete to form a basis for deliberation. The medical man who encourages the callow medical student to play the part of the experimental animal in this connexion shows a courage which is as reprehensible as it is vicarious. A separate chapter is devoted by Dr. Trüb to the problem of post-mortem infection. About 30 cases of such infection have been recorded, but only about four of them stand criticism, and even in these four cases the evidence is not as complete as it might be. Incidentally, this monograph shows very clearly how nebulous the conceptions of syphilis were up to the time of Jonathan Hutchinson; the vast literature referring to pre-Hutchinson cases of syphilis is practically valueless as judged by modern standards of diagnosis. But even though proven cases of post-mortem infection with syphilis are very rare, this risk cannot be regarded as negligible, and reference is made by Dr. Trüb to the investigations of Prof. E. Hoffmann, who addressed a questionnaire on this point to numerous pathologists and specialists in syphilis. He obtained 29 answers, and in eight of them accounts were given of more or less definite cases of post-mortem infection. One of the most interesting but most incomplete chapters is that concerned with syphilitic infection without a primary chancre. At least 16 such cases have been recorded in which the patient was a medical man, and in five of these cases the infection was extragenital and vocational.

An important question asked by Dr. Trüb is: How shall the medical man who has contracted syphilis comport himself with regard to his professional work? The answer given is quite definite. In the primary and secondary stages, and when there is a definite rash on the hands and arms, no medical man should attempt to operate or attend maternity cases. When the syphilis is in the tertiary stage, it may be sufficient to protect the limbs with rubber or plaster, but it would be well if full work were not resumed until vigorous specific treatment has been shown by the Wassermann reaction to have been successful. Even then the medical man should undergo systematic serological and clinical examination from time to time, keeping an alert eye for any signs of syphilis of the hands and arms. If the Wassermann reaction is positive, it is necessary to be careful, and, preferably, to discontinue medical practice, even when there are no symptoms. This is a hard saying, and obedience to it must often entail a self-sacrifice verging on economic ruin. But its neglect may sometimes have far-reaching consequences, and there have undoubtedly been several cases of syphilis transmitted to patients by midwives and medical men. In one instance alone a midwife has been known to infect 30 women. This case was recorded in 1883, and it is to be hoped that with our present knowledge—diagnostic and therapeutic—of syphilis, the vocational syphilis of doctors has become a much less serious matter than it was.

WORK OF THE ROCKEFELLER FOUNDATION.

IN the review for 1922[1]—including a summary for the first decade—of the work accomplished by the Rockefeller Foundation, by the President, Mr. George E. Vincent, there is presented a survey of unparalleled beneficent work. The Foundation was originally incorporated on May 14th, 1913, under a special charter by the State of New York, and with an initial endowment of $100,000,000, the gift of Mr. John D. Rockefeller. During the past ten years the Foundation has received from its founder a total of $182,704,624. Its total disbursements have amounted to $76,800,000, representing the income from year to year, and $17,500,000 appropriated from principal. In addition, it has pledged future income to the extent of $15,600,000. There is an interesting review of the growth of the science, whose progress, it is pointed out, has followed in a general way Comte's law, which asserts that every body of knowledge passes through two stages, the theological and the metaphysical, into a third, the positive or scientific. This theme is expanded into a chapter on "From Magic to Microbe," and then into an exposition of "Methods, Spirit and Scope of Modern Medicine." As to public opinion and medical progress, it is wisely remarked that unless the leaders of opinion and a substantial proportion of the adult population appreciate the aims and methods of science, science cannot attain the place it deserves or render the service of which it is capable. But in spite of all efforts and in face of evidence there are disheartening instances of an almost benighted ignorance. The remarks on vaccination are singularly appropriate at this juncture.

> "If there is one thing that has been repeatedly demonstrated to the complete satisfaction of all well-trained minds capable of dealing logically with evidence, it is that vaccination for small-pox affords an extraordinary immunity against that disease.....In the United States the disease is widely diffused; in some regions it is almost endemic. Anti-vaccination societies carry on fanatical campaigns of misrepresentation, offering misleading statistics, invoking the authority of discredited physicians, citing unverified cases, and making emotional appeals."

There are some valuable remarks on "the training of doctors," and it is pointed out that "the idea of teaching the medical student all that is known about health and disease is on the face of it absurd." A tentative list of the medical schools of all countries prepared by the Foundation shows that there are in all 445 schools, distributed geographically as follows: United States 82, British Isles 43, France 32, Russia 28, Germany 25, China 24, Italy 21, Japan 20, India 18, Spain 11, Mexico 11, Brazil 10, Canada 9, Netherlands 8, Switzerland 5, Belgium 5. Forty-four other countries support from one to four medical schools each. It is the aim of the Foundation to hasten the development of international coöperation in medical education by all available means. An account is given of what has been done for the Peking Union Medical College, and the aid afforded to European medical scientists. Much stress is laid on the training of health staffs in connexion with public health and preventive medicine, and the manner in which this is carried out. Significant and instructive are the titles of other chapters—"Closing in on Yellow Fever," "Controlling Malaria at Low Cost," "Hookworm Disease as an Educator." We have travelled a long way since the first European conference to consider health problems—representing 12 nations—was held in 1851. In the field of international hygiene there has been established a recent creation under the League of Nations of a health organisation which has the support of 52 nations and the sympathetic coöperation of the United States. The Foundation also works through non-governmental organisations and voluntary institutions of various kinds in order to carry out its chartered purpose, which is to promote, not the exclusive prosperity of any one nation, but "the well-being of mankind throughout the world."

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[1] Die Syphilis als Berufskrankheit der Aerzte. Von C. L. Paul Trüb. Carl Marhold Verlag, Halle a. S. 1923. Pp. 126.

[1] The Rockefeller Foundation: A Review for 1922 and a Summary for the First Decade. New York. 1923.

THE FIGHT AGAINST RABIES IN DOGS.

THE importance of the strictest observance of the regulations in force with regard to rabies in dogs can hardly be overestimated. Whereas in this island country the number of infections have been reduced to a vanishing point, on the Continent, owing largely to laxity during the war and post-war periods, the disease is greatly on the increase. Recent figures collected in Vienna[1] show that the number of infected dogs trebled during the years 1919–22, and that during the same period the number of human beings treated at the Lyssa Institute doubled. The number of dogs registered in Vienna rose in those years from 37,000 to 77,700, so that in 1922 there was roughly 1 dog to every 24 inhabitants, children included, and this number does not account for the many unregistered dogs. The effect of legislation in the directions of a dog tax, compulsory muzzling, immediate notification and destruction of all dogs known to be or suspected of being infected, regular periodic examination of all dogs and notification of all dog-bitten humans, has been remarkable, as figures from many countries show. The experience gained during the last 40 years at all treatment centres teaches that if these measures were systematically and conscientiously carried out, the disease might be completely wiped out; but it has been found extremely difficult to insist on such measures even in the large towns, and still more so in the outlying districts. One factor that has to be reckoned with is the human love of dogs, and this presents one of the greatest difficulties. Education of the public is one of the most important factors in dealing successfully with the problem. Legislative measures will take a long time to free mankind from the scourge, and therefore additional measures might well be adopted. Dr. Schnürer has since 1905 been employing prophylactic inoculation of dogs against the disease, a measure first suggested by Pasteur, and later worked out by Bouley (1884) and Högyes (1889), but the difficulty in applying it on a large scale to all dogs lay in the fact that to produce sufficient attenuated virus (fixed virus) not all the rabbits in Australia would suffice, and therefore Dr. Schnürer has worked out a scheme whereby stronger and more virulent doses are given, so that fewer injections are necessary, reducing the number from 14 to 2–3. According to the present experience at the Lyssa Institute, the duration and effectiveness of the protection afforded by inoculation depends on the quantity of the fixed virus introduced. As the result of experiments on 93 dogs it was found that by giving 1–2 doses containing a total of 0·33–20·0 g. of the virus subcutaneously or intraperitoneally, the animals could be immunised against infection introduced intraocularly, subdurally, or intramuscularly with 63·6–100 per cent. successes, depending on the nature of the virus and the site of introduction of the infection. Such doses were not injurious to the animals, and the immunity commences on the thirteenth to eighteenth day and lasts up to five years. To demonstrate the use of prophylactic inoculation Dr. Schnürer is now engaged in carrying out experiments on privately owned dogs, who attend as out-patients. He inoculated 50 with five injections of virus in increasing doses, giving a total of 0·665 g. The next 90 dogs were given four injections containing 0·76 g. altogether. One of these was previously bitten by an infected dog and died of rabies; in the rest up to date there has been no evidence of the disease. Fuller details and tables of results are given in the original article.

THE PRODUCTION OF CLEAN MILK.

WHILE official machinery for encouraging the production of clean milk is grinding slowly, and let us hope surely, towards its appointed end, there are abundant indications of a keen desire within the dairy trade itself, and in a variety of bodies associated with the trade, for an improvement in the purity of the milk-supply. We have before us a pamphlet on "Milk Competitions," by the National Clean Milk Society, a body whose avowed object is "to raise the hygienic standard of milk and milk products, and to educate the public as to the importance of a clean and wholesome milk-supply." The pamphlet gives a lucid and useful description of methods of improving the production and the quality of milk through the stimulus afforded by competitions. Two score card systems are described, the more elaborate adapted for assessing the efficiency of production, and the simpler system for evaluating the quality and purity of the final product. The information is set out in simple style. It is suggested that the promoters of such competitions might arrange for the prizes to be offered either by public health authorities, by local organisations anxious to promote improvement in the hygienic quality and chemical composition of the milk-supply, or by firms directly interested in the milk industry. In the same connexion reference may be made to a paper by Mr. A. T. R. Mattick, of the National Institute for Research in Dairying, Reading, on the production of clean milk. The paper deals in detail, in the clearest way, with the whole course of production of milk, from the cowshed and the milking shed to the milk room up to the stage of bottling, including details of the preparation of utensils, of premises, and of the cow. The pamphlet does not aim at putting forward any specially original views, but it succeeds in providing a simple and systematic description of procedure which should be of real value to the dairy farmer. The distribution of instructions of this type throughout the dairy industry—especially if such distribution were organised by the industry itself—would be more likely to create an atmosphere leading to improvement in milk-supply than the most heroic efforts of the official administrator. The process of cleaning must indubitably, if it is to be effective, come from within the dairy trade itself.

INTERNATIONAL CONFERENCE ON LEPROSY.

THE Third International Conference on Leprosy assembled at Strasbourg from July 28th to 31st. Official delegates representing 46 countries attended this conference, and a number of learned societies and other organisations from different countries were also represented. Great Britain, India, Australia, and some other British dominions, colonies, and protectorates were separately represented by official delegates. The conference was opened by Mr. Paul Strauss, the French Minister of Health, and the scientific sessions were held under the presidency of Dr. Ed. Jeanselme, professor of medicine in the University of Paris. The official text of the resolutions embodying the conclusions arrived at as the result of the deliberations of the conference is as follows:

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[1] Prof. Josef Schnürer, Wiener klin. Wochensch., July 12th, 1923.

La 3ème Conférence Internationale Scientifique de la lèpre maintient les principes d'organisation de la lutte contre la lèpre admis par les conférences précédentes et adopte les résolutions suivantes :

(1) Les prescriptions legislatives concernant la lutte contre la lèpre doivent différer suivant les pays auxquels elles s'appliquent, mais, dans tous les cas, il faut interdire l'entrée des lépreux étrangers.

(2) Dans les pays où la lèpre est peu répandue, l'isolement dans un hôpital, ou à domicile si celui-ci est possible, est recommandé, tel qu'il est pratiqué en Norvège.

(3) Dans les foyers d'endémie lépreuse, l'isolement est nécessaire. (*a*) Cet isolement doit être humanitaire et laisser le lépreux à proximité de sa famille, si cette mesure est compatible avec un traitement efficace. (*b*) S'il s'agit d'indigents, de nomades ou de vagabonds et d'une façon générale de personnes qui ne peuvent être isolées à domicile, l'isolement sera pratiqué et le traitement le plus efficace sera appliqué dans un hôpital, un sanatorium ou une colonie agricole suivant les cas et les pays. (*c*) Il est recommandable de séparer de leurs parents les enfants de lépreux dès leur naissance et de les maintenir en observation.

(4) Les membres de la famille du lépreux doivent être soumis à des examens périodiques.

(5) Il faut faire savoir aux populations que la lèpre est une maladie contagieuse.

(6) Il y a à interdire aux lépreux les métiers qui les exposent à propager les germes de leur infection, mais en ce cas la société a le devoir de considérer que cette interdiction lui impose l'obligation d'assister le malade et les personnes dont il est le soutien.

As no official English text of these resolutions was presented or discussed at the conference, it would obviously be out of place to print an unauthorised translation of them.

DECAPSULATION OF THE KIDNEY IN ECLAMPSIA.

Dr. Albert Niedermeyer,[1] of Schönberg, reports a case of severe eclampsia with coma, in which the life of the patient was saved by decapsulation of the kidney.

On Jan. 9th, 1923, the patient, a primipara, aged 20, was seized with eclamptic convulsions, which rapidly increased in severity and frequency until they were almost continuous. The presentation was normal, and the membranes were intact, but the fœtal pulse-rate rose rapidly and was soon imperceptible. Catheterisation produced a few drops of brownish urine, which solidified on boiling. As the condition was urgent, and there was little possibility of saving the child (seventh month) perforation was undertaken under light chloroform anæsthesia, and the uterus was emptied. Treatment by venesection, morphia, and chloral in a darkened room was given, but the hope that the rapid emptying of the uterus would arrest the convulsions was not realised. On Jan. 10th, at 10 A.M., saline was given, one litre rectally and one litre subcutaneously, and at 11 A.M. venesection was repeated. During the afternoon coma set in with loud snoring, cyanosis, and foaming at the mouth; at 3 P.M. the saline infusion was repeated, but the coma deepened and was accompanied by complete anuria. A few drops of urine which were withdrawn coagulated. The respiration and pulse became worse, the face and lips were blue, the pupils dilated and fixed, the face sunken, and there was a tracheal rattle. As death seemed imminent decapsulation was undertaken as a last resort. At 5 P.M. the kidney was exposed under light chloroform anæsthesia, and without displacing the organ the capsule was removed as far as possible, the remainder being stripped back as far as the hilum. The wound was closed in layers and a gauze strip inserted into the lower angle. From the time of the operation onwards there were no further convulsions, the respirations and pulse improved, and the coma lessened into a quiet sleep, with disappearance of the cyanosis. On the following day, at 6 A.M., the patient reacted when spoken to, and at 9 A.M. 300 c.cm. of light-coloured urine were withdrawn on catheterisation; albumin by Esbach ½ per thousand. In the evening 200 c.cm. were withdrawn with a trace of albumin, and during the night a quantity of urine was passed spontaneously. On Jan. 12th consciousness returned, and from the next day the urine remained free from albumin. The wound healed by first intention, and on the 27th the patient was discharged.

In this case it can hardly be doubted that the operation was directly responsible for the immediate improvement. Dr. Niedermeyer is of the opinion that had it not been so, the condition of the patient was so grave, that an intervention of that magnitude must have been fatal. Of interest is the rapidity with which the operation had effect. Dr. Niedermeyer quotes Edebohl, who holds the view that decapsulation first shows its effect 10 days after the operation; but from the experience derived from the case reported, he cannot agree with him. It was obvious that here the effect was immediate, but he is inclined to think that the operation should only be undertaken in cases of acute anuria, and that in such cases it can have no purpose unless the effect is immediate. In discussing the mechanism of the results of decapsulation, he reminds us of the view expressed by Edebohl and others that new blood-vessels are formed between the surface of the kidney and the surrounding fat capsule, and thus the blood-supply to the organ is improved. But it has been shown that in some cases a new fibrous capsule very soon develops in place of the one removed, possibly before the new capillaries have had time to form, and anyway, if a new capsule did not grow, the development of the new blood-supply would be too late in acute cases, where the effect is required immediately. Most recent authors take the view that the chief effect lies in the mechanical relief of the renal tension, and the French writer Pousson, speaks of "glaucoma of the kidney." It appears that in acute anuria it is the enormous rise of intrarenal pressure, increased by the non-elastic, firm capsule, that leads to obstruction to the circulation and to the outflow of urine, and finally, to complete paralysis of the secreting cells. If this explanation is accepted, it is obvious that if decapsulation helps the kidney, it does so immediately, and it also explains why in chronic cases the results are so disappointing. It also explains why unilateral decapsulation is sufficient, for no sooner is the pressure on one side relieved, and the passage of urine accomplished, than is the attempt at secretion by the other lightened, and so the vicious circle is broken. The second kidney then gradually recovers its equilibrium. Obviously the danger of a unilateral operation is less than a bilateral, especially as the operation is hardly to be recommended except when other measures have failed and the patient is in extremis.

THE MIDDLE WAY IN THE TREATMENT OF FUNCTIONAL NERVE DISORDERS.

Dr. R. G. Macdonald Ladell, in the *Practitioner* for August, presents certain principles which have emerged from the chaos of controversy. His "middle way" lies between psycho-analytical technique on the one hand, and the total neglect of mental processes on the other. There can be but few practitioners, he judges, whose work brings them much in contact with nervous disorders who do not realise the fundamental truths of Freud's doctrines; yet, though for some cases psycho-analysis is necessary, current conflicts predominate in most of the patients who seek the aid of the physician, and for these no deep analysis is needed. But the physician must be prepared to discuss many questions, both in regard to sex and to other difficulties, when the shoe of civilisation pinches, and he must be free of embarrassment or diffidence, which, if shown by him, will only increase the patient's repressions. Plainly, as Dr. Ladell says, the personal factor is bound to count largely when dealing with these cases, and his remarks suggest that radical differences of opinion on what should be matters of observation perhaps have their origin in the temperament of the observers. We can imagine the neurotic, who is often sensitive and over-scrupulous, withdrawing into the protective shell of reticence at the slightest hint of surprise or embarrassment on the part of the physician, just as we can imagine—or perhaps recall—physicians whose manner invites that open confession which is good for the soul. One temperamental type of medical man finds himself making observations and gathering facts about neurotic illnesses which for another type remain as in a closed book. The fundamentals of psychopathology are now sufficiently established for such inequalities to be lessened by giving instruction in the subject to the medical men and women of the future. Whatever kind of case may be allotted to the psycho-therapist, the middle way in treatment must be the way of the general practitioner.

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[1] Deutsche medizinische Wochenschrift, June 8th, 1923.

PROF. IVAN PAVLOV IN LONDON.

At the conclusion of a two-months tour in France and the United States, Prof. Ivan Pavlov of Petrograd attended the International Congress of Physiology at Edinburgh, after which he spent a week in London before returning to Russia. We have received from a correspondent an account of a visit which he paid to the Middlesex Hospital on August 6th, when he was received by a number of members of the medical staff of the hospital and its medical school, and expressed appreciation of all that he saw, being particularly interested in the cases of diabetes under treatment with insulin, and in the new laboratories which are shortly to be opened. The eminent physiologist, who is now in his seventy-fourth year, is a striking example of the boundless activity and imaginative force which is the gift of the greatest scientists. Amidst the tragic chaos of the revolution in Russia he has been able to continue his work, and it comes as a surprise to many in this country to learn that at the present moment he has some 30 fully-qualified assistants working under him at his laboratories at Petrograd. Prof. Pavlov, during his visit to the Middlesex Hospital, made especial comment on two things. The first was that the hospital, the research departments, and the medical school formed a complete unit, allowing the fullest coördination between teaching, research, and modern treatment, a condition of affairs seldom successfully realised elsewhere. But side by side with this he was disappointed to find here, as in other institutions in England, that research is seriously hampered by the severity of the restrictions on vivisection. The wide repute of Pavlov's book on the "Work of the Digestive Glands" may have obscured the realisation in the minds of the medical profession of the fact that his work has chiefly been concerned with the physiology of the central nervous system. For many years past his experiments have been directed to elucidate the problems of sleep, inhibition, and conditional reflexes. We are happy to learn that this work is now far advanced, and that Prof. Pavlov hopes in the autumn to bring out a book which will be to the neurologist as profoundly interesting and important as was his work on digestion to the general physician and physiologist.

King's College Hospital.—An extraordinary meeting of the Committee of Management of King's College Hospital was held on August 9th to authorise the establishment of a dental school under the direction of Dr. Alexander Livingston of Liverpool University. At the same meeting was received the resignation of Mr. F. F. Burghard, senior surgeon, to whose work in connexion with the hospital and medical school a tribute was paid by the chairman, Viscount Hambleden. He is succeeded on the committee as senior surgeon by Sir G. Lenthal Cheatle. To the committee was also added Mr. P. A. Willson. The other business included the appointment of Mr. H. J. R. Surrage as an additional honorary anæsthetist. The committee passed a resolution of thanks to the Winter Distress League for undertaking a considerable amount of cleaning in different parts of the hospital which could not otherwise have been done owing to lack of funds, and also gratefully accepted the offer of the Talfourd College for Girls to maintain a cot in the children's ward.

Modern Technique in Treatment.

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XXXIII.

TREATMENT OF SYPHILIS IN THE WOMAN OF CHILD-BEARING AGE.

Some competent observers have stated that syphilis in women is in the main a much less serious infection than it is in the male. This may be so for the individual, though I am not prepared wholly to admit it; but for the ultimate welfare of the race no case of syphilis in a woman can possibly be dismissed as a light case, or as necessitating a lower standard of treatment than one showing more serious manifestations. The treatment of syphilis in women presents two different aspects: the first is that of acquired syphilis with signs and symptoms as in the male; the second is conceptional syphilis in which frequently during the child-bearing period no signs appear, the woman complains of no disability, but gives birth to premature, stillborn, or weakly and diseased children.

Acquired Syphilis in Primary or Secondary Stage.

Here the treatment is straightforward, its duration depending on the stage at which the case is seen; the patient requires a minimum of two years' steady treatment if seen in the primary stage—considerably more if not seen till secondary lesions are present.

If properly prepared—i.e., with bowel empty and no meal having recently been taken—women almost always take intravenous injections of 914 preparations well. At the menstrual period a smaller dose may well be given, but otherwise doses ranging from 0·3 to 0·6 g. are injected once a week, either of novarsenobillon, sulfarsenol, or stabilarsan, till 4 g. in all have been given. At the same time pil. Hutchinson should be taken thrice daily and a gargle of pot. chlor is used as routine after each meal. In my experience women much prefer taking pil. Hutch. orally rather than have the routine injection of Lambkin's cream in addition to the 914 injection. After a course of 914, pills are stopped for two weeks, and then a Wassermann test is done. If the W.R. is negative and the case was first seen in the primary stage, the patient is allowed to carry on with pills alone for two months when the W.R. is again tested; but if the case was first seen only when well-established secondary lesions had developed, the patient is given pills to last a month and told that a further set of injections will be given at the end of that time. The patient either takes a little sulphur at night during this month—many patients like confection of sulphur or trochisci sulphuris as aperients—or else the second course of injections is ushered in by an injection of intramine, sulphur being used as an antidote to, or as a preventive of metallic poisoning by arsenic or mercury. The second course of injections may be of a slightly different type from the first—i.e., if N.A.B. was given in the first instance, sulfarsenol (0·36 to 0·6 g. dose may be given, or silver salvarsan (0·1 to 0·3 g. dose till 1·5 g. of the latter or 4 g. of the former have been given. The W.R. is then repeated, and if it is negative and if no signs or symptoms are present the patient is treated by pills only. The urine is tested for albumin as routine before each injection and inquiry is made as to any unpleasant symptom following the last injection—any complaint of headache, sickness or urticaria requiring careful investigation. Bowels should be carefully regulated with salines and all carious teeth must be removed.

During the remainder of the treatment Wassermann tests are taken about every three months and a further course of injections is given if required. If all the tests are negative and the patient's condition is satisfactory pills only are given during the remainder of the time.

Standard of Cure in Women.

The standard of cure adopted at my clinic is persistently negative W.R. over two years without sign or symptom, even after a provocative injection has been given. If this standard is met by a patient she is discharged, on the clear understanding that if she becomes pregnant she must return for treatment by the time she is eight weeks pregnant. A case first seen in the late secondary stage is hardly likely to reach this standard of cure, and in many cases these patients after three years steady treatment are sent away and told to return twice a year for a month's ntensive treatment—i.e., injections of 914 and a mixture of potassium iodide and mercury. This method of dealing with intractable cases has so far given most gratifying clinical results.

Conceptional Syphilis.

A considerable number of women are met with who have given birth to stillborn or diseased children without themselves showing any signs of acquired syphilis, at least during the child-bearing period. These are mainly the wives of men who have had syphilis and have been insufficiently treated. These cases are most intriguing and sometimes very difficult to diagnose as they are frequently seen for the first ime during pregnancy, having been referred for an opinion from a maternity centre. When besides a history of ante-natal and neo-natal deaths a positive W.R. is obtained, treatment is at once instituted; but the W.R. is very uncertain during pregnancy and ust after delivery, so that a negative W.R. does not of necessity exclude conceptional syphilis. In such a case an effort is made to get an interview with the husband and often a very old history of syphilis is obtained, the man frequently having forgotten about t as he has had no symptoms and has not connected his wife's obstetric calamities with his old disease. I could quote instances of this type of case in which the woman's W.R. had never been positive.

It is held by some syphilologists still that a mother with no symptoms and a negative W.R. is not herself syphilitic and does not require treatment. This seems to me an unsound theory; there appears to be n these cases of conceptional syphilis a degree of mmunity in the mother herself which frees her from signs and symptoms of syphilis *during the child-bearing period;* but after the menopause symptoms frequently appear. There are in my department several women past the menopause who never had syphilitic manifestations while childbearing, and now have gummata of the back or thigh or the common ulceraion of the outer side of the ankle and a positive W.R. n practically every history a case is obtained of stillbirths or of delicate weakly children who died young; one woman, who was perfectly well till a gumma occurred on her thigh this year, has her youngest child, aged 19 years, being attended at an eye hospital for "Hutchinson's salmon patches." I think this post-menopausal appearance of symptoms is a complete refutation of the claim that these women are not syphilitic.

Treatment of Syphilis During Pregnancy.

The treatment of syphilis in women during pregnancy is practically the same as at other times. These cases of conceptional syphilis are at once given oil. Hutchinson and have a weekly injection of 914 for about six weeks; after that a fortnightly one till 4 g. has been given. Injections may be given right up till the day of delivery without ill-effect. Patients are encouraged to return as soon after delivery as possible and are then given from 6 to 10 fortnightly injections of 914 while suckling. Cases that have previously had omplete treatment for syphilis require, of course, only a few injections during pregnancy, an injection every hree or four weeks usually being ample. There has been practically no toxæmia in these cases and the hildren are remarkably satisfactory, strong, without esions, and in most cases above the average birth weight. One little known but quite definite symptom present in some of these cases of conceptional syphilis is a purulent vaginal discharge which may be slight or profuse, *is not gonococcal*, and clears up without any local treatment when antisyphilitic measures are adopted. This symptom has to my knowledge been mentioned in this country by only one other observer, Prof. W. C. Swayne,[1] of Bristol, but has been seen by me for some years and pointed out to students.

Conclusion.

I would emphasise the necessity for all practitioners to have their cases of possible conceptional syphilis carefully investigated. With a history of stillborn or weakly children and with no toxæmia of pregnancy or obvious disease of either parent the possibility of conceptional syphilis must be borne in mind; the results of treatment far outweigh any slight inconvenience—they are really brilliant; the technique is simple and the cost very moderate.

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Special Articles.

FACTORY INSPECTION IN 1922.

REPORT OF THE CHIEF INSPECTOR.

The report of the Chief Inspector of Factories[2] shows how the work of his department is becoming more and more technical and specialised; thus while there are 137,858 registered factories (apart from 145,684 workshops which for the most part are small and of inconsiderable importance), special codes of regulations, in addition to the main provisions of the Factory Acts, apply to 99,332 works or departments within works. The duty of enforcing the requirements of these codes calls for technical knowledge and must be onerous. Accident prevention has continued to receive special attention, and important progress is reported in improving the standard of safeguards; but the spirit of safety-first—the appeal to the mentality of the worker—is being called upon to effect better results. Instances of its value are quoted: a fall from a figure of 94 in 1920 to one of 52 in 1922, combined with a lessened severity rate from 1·44 days lost per 1000 workers to 0·88; a reduction in lost-time accidents from 347 in 1919 to 80 in 1922; a reduction in compensation paid per £100 wages from 5*s.* 6½*d.* in 1914 to 2*s.* 10*d.* in 1922. Such instances are proof of the value of eliminating hazardous practices. Accidents are frequent among casual labour, but far less so among regular and experienced workers; hence labour turnover should be minimised. Hours of work would appear to have been permanently reduced without recourse to legislation, and now rule at from 44–48 per week. Output would not seem to have materially suffered, while overtime rates militate against any extension in the future; the half-time system for children has disappeared even in Lancashire; the two-shift system has not had a fair trial yet, as, although 235 Orders have been made permitting it, it has, owing to trade depression, been actually used in only few cases.

Voluntary (in contra-distinction to statutory) welfare is holding its own, it is the direct outcome of the war period and is the spirit of true welfare, which must come from within—from the workers themselves and the management. In one interesting scheme the vicar of the parish acts successfully as welfare supervisor, even seeing after the fencing of machinery. Another venture is the combination of employers to support schemes for all their employees. Statutory welfare is enforced by special orders, of which there are now many applying to different industries; good work is being done thereby, but there is danger lest the letter, rather than the spirit, is complied with. First-aid equipment is now an integral part of works organisation, and septic poisoning is being materially reduced thereby, a decrease of 50 per cent. being reported by one insurance company.

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[1] Brit. Med. Jour., 1921, ii., 476.

[2] Annual Report of Chief Inspector of Factories for 1922. H.M. Stationery Office. [Cmd. 1920.] 1923. Pp. 153. 5*s.*

Lead Poisoning.—Electric Shock.

Dr. T. M. Legge's report is rather shorter than usual; he tells of the control maintained over lead poisoning, which now only accounts for less than 250 cases a year, whereas ten years ago 500 cases seemed to be an irreducible minimum; the pottery industry still contributes unduly to the total. Interesting figures are given of the occurrence of epitheliomatous ulceration; 64 per cent. of the cases were between 40 and 60 years of age, and 20 per cent. over 60; 51 per cent. had been employed 20 years and over with exposure to pitch, tar, or paraffin; the face and neck were implicated in 43 per cent. of the cases, and the scrotum and groin in 29 per cent. The examination by certifying surgeons of young persons for fitness is gradually increasing in importance, but remains unsatisfactory for lack of any subsequent examination; about 2 per cent. of juveniles were rejected as unfit.

Mr. G. S. Ram deals with accidents due to electric shock, and again stressed the need for prolonged artificial respiration in every case; he instances cases brought round after 15, 20, 30, and 45 minutes, as well as others where efforts were either not attempted or given up after a few minutes. He puts forward an observation, quaint and unexpected, that after severe and prolonged shock, if the patient has a bad fall but escapes from fatal injuries, he recovers from the shock; and asks whether mechanical shock may not be a successful form of treatment for cardiac fibrillation, and how it should be applied.

Special Research Work.

A feature of the report is the inclusion of special research work; that of Dr. G. L. Middleton on the effects of dust inhalation will be referred to in connexion with a special report by the same author in collaboration with Dr. E. L. Macklin; another report, by E. M. Hewitt and E. M. Bedale, concerns the physiological cost to women of different methods of weight-carrying. This is an instance of laboratory research directed to elucidate a practical problem; different weights were carried (*a*) on a tray, (*b*) on a tray with shoulder strap, (*c*) with load divided, and (*d*) with load on shoulder, while the oxygen consumption per horizontal kilogrammetre of work was estimated. For loads of 20 to 30 lb. the method of carrying seemed to be a matter of personal choice; at 40 lb. a divided load or shoulder carrying was more economical; at 50 lb. shoulder carrying was cheapest. Details of the observations made and illustrative graphs are given.

CONGRESS OF THE ROYAL SANITARY INSTITUTE AT HULL.

IN THE LANCET of August 4th (p. 251) we dealt with the opening of this Congress and the President's address. The business of the Congress was transacted in four sections—viz., Sanitary Science, Engineering and Architecture, Maternity and Child Welfare (including School Hygiene), and Personal and Domestic Hygiene, and in seven conferences—viz., those of Sanitary Authorities, Port Sanitary Authorities, Medical Officers of Health, Engineers and Surveyors, Veterinary Inspectors, Sanitary Inspectors, and Health Visitors. The multiplicity of subjects was so great that it may be truly said that every delegate had some opportunity of voicing what was in his mind. It was perhaps inevitable that occasionally the programme should be overloaded, but we would respectfully suggest to the management that at future congresses the business should begin at 9.30 A.M. and end at 1 P.M. The nominal hours were from 10 to 2, but the hour from 1 to 2 P.M. is purely nominal. We would also suggest the limitation both of the number and duration of the presidential addresses. Space permits reference to only a very few of the subjects discussed.

Housing.

The housing question, as was natural in the present parlous condition of housing, received much attention. The city engineer of Edinburgh, Mr. A. H. Campbell, advocated the acquisition by local authorities of all slums in their areas with a view to putting them into a better state, pending the erection of a sufficiency of new houses. Alderman Cheverton-Brown, secretary of the National Federation of Property Owners, voiced the difficulties of property owners, including the problem of the dirty and destructive tenant. His remedy for house shortage was the removal of restrictions, the restoration of confidence amongst investors, and the encouragement of private enterprise. Miss A. Churton, secretary of the Rural Housing and Sanitation Association, also favoured the acquisition of unhealthy areas and their management on lines associated with the name of Miss Octavia Hill. The woman's part in smoke abatement was ably dealt with by Mrs. Cloudesley Brereton, and the much more extended use of electricity in the home was advocated in a practical manner by Lieut.-Colonel Vignoles, borough electrical engineer of Grimsby. The latter's ideal was a house with one fire for the hot-water cistern, and in which electricity is used for lighting, cooking, heating in the other rooms, and as an auxiliary to the hot-water supply.

Preparation of Food.

The hopeless state of housing probably stimulated interest in the food question. Miss Florence Petty indicated how better knowledge of cookery might be conveyed to existing mothers. Mr. A. R. Tankard, F.I.C., showed that 20 per cent. of our foods, exclusive of milk, are chemically preserved. The need for much greater cleanliness in the preparation and distribution of food was discussed by Dr. W. St. C. McClure, who advocated the licensing and supervision of all premises where food or drink is prepared or served. The importance of food, and especially of a vitamin-rich diet, as a means of increasing resistance against tuberculosis and of preventing a minor infection from developing into recognisable disease was strongly emphasised by several speakers.

Other Topics.

Dr. O. K. Wright (of the Ministry of Health) supplied an interesting paper on scientific methods in public health propaganda, and Dr. W. Allen Daley (M.O.H., Blackburn) dealt with this subject in special reference to cancer. Light treatment was dealt with at various sessions, and Sir Henry Gauvain gave an instructive address on Alton methods. A thoughtful and suggestive paper on infantile mortality by Prof. F. E. Wynne (M.O.H., Sheffield)[1] provoked a good discussion, but seemed to be misunderstood by several members of his audience. Papers by Dr. S. G. Moore (M.O.H., Huddersfield) and Dr. H. Scurfield (formerly M.O.H., Sheffield) dealt more particularly with that portion of infant mortality which occurs in the first month of life. While Dr. Scurfield left it an open question as to how the new midwifery—i.e., the execution of the skilled obstetrical work during pregnancy instead of as an emergency procedure during labour—was to be carried out, Dr. Moore advocated the Huddersfield system of notification of pregnancy, by means of which the expectant mothers are visited at home by duly qualified doctors appointed by the corporation.

Tuberculosis and Milk.

In the discussions on the prevention of tuberculosis some speakers favoured the cutting off of the supply of seed and others favoured making the soil unsuitable; the Greek representative, Dr. Alexander Cawadias, intervened usefully to point out that we

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[1] See THE LANCET, August 4th, p. 211.

ust have a combination of both methods. It is ways a little unfortunate, and must be mystifying the lay public, that medical speakers do not make vo points clear in these discussions on the prevention tuberculosis—viz.: (1) that a safe milk-supply an only prevent the human mortality caused by ovine tuberculosis, estimated at 6½ per cent. of the otal tuberculosis mortality, or 3000 deaths annually England and Wales; (2) that the 90 per cent. of fections with tuberculosis which occur in childhood o not as a rule become recognisable disease, and ther heal up or become latent. The possibility of tency indicates the need for increasing resistance, ut the undue influence of the universality of infecon doctrine leads to fatalism, and a conviction that easures to prevent infection, even massive doses infection, which, along with other conditions, give e latent disease its chance of becoming active, are itile. The importance of milk as a food had due rominence. Dr. Stenhouse Williams put the case bly for what may be called the Reading system of rade A tuberculin-tested milk at a cost little above at of ordinary milk; Dr. S. G. Moore presented e case for pasteurised milk, while there were not anting advocates of dried milk. Again, it is unformate for the information of the public that medical eakers should speak loosely of the destruction of itamins by heating processes, without mentioning hich vitamin, seeing that it is now generally recogised that in most heating processes the vitamin estruction is limited to a portion of the vitamin C ntiscorbutic), and easily compensated for by range juice, &c. The "nature" argument in vour of raw milk was met with the response that ow's milk, its derivatives butter and cheese, and eggs re quite unnatural foods for man, and that the only asonable method is to apply the tests of modern ience to the foods which man uses, and decide hether they are good, bad, or indifferent. The perience of China was mentioned as a country ddled with tuberculosis, in which cow's milk was ot used, but no information was available as to hether the type of tuberculosis is more virulent ere, in a population presumably not immunised in y degree by bovine tuberculosis. In any case he ould be a bold man who would suggest the general e of raw milk for children, seeing that the present rtial use of it constitutes an immunisation experient which causes the deaths of 3000 children nually in England and Wales, and a corresponding amage rate. Dr. J. Cates (M.O.H., county of Surrey) ntributed a paper on the training of women for blic health work, which ended with the expression his conviction that the trained nurse will come to her own and will be allowed to follow a career r which she is particularly well adapted.

Dr. R. A. O'Brien (of the Wellcome Research aboratories) advocated the use of the Schick test sanitary authorities, and expressed the opinion at the time will come when the occurrence of a se of diphtheria amongst the staff of a fever children's hospital will indicate unforgivable glect.

In a paper on Practical Disinfection Prof. H. R. enwood criticised the tests at present in use for sinfectants, and the misleading statements made manufacturers on the strength of such tests. He ought manufacturers making false claims should liable to heavy penalties, as is the case in America.

A paper by Dr. E. Colston Williams aroused conlerable interest, and showed that the movement in vour of pit-head baths is making headway.

Dr. G. A. Auden (school medical officer, Birmingam) recorded the particulars of an interesting periment, under which children suffering from alnutrition were given an extra milk ration. The periment lasted several months, and the results, th physical and mental, were remarkable. The periment was very carefully conducted, and Dr. uden hoped it would be the precursor of other periments on a larger scale.

PUBLIC HEALTH LEGISLATION IN THE IRISH FREE STATE.

A DEPUTATION from the Irish Medical Committee, consisting of Dr. J. M. Day, Senator W. O'Sullivan, M.D., Dr. R. J. Rowlette, Dr. J. P. Shanley, Dr. T. Hennessy (medical secretary), and Mr. C. H. Gick (secretary), waited on the Minister of Local Government (Mr. E. Blythe), Irish Free State, on August 1st. The deputation was accompanied by representatives of the Connemara medical officers. The deputation was introduced to the Minister by Prof. M. Hayes, T.D., National University (Speaker in the Dail). Its main object was to make certain representations with regard to the Public Health Bill, which was to have been brought forward in the Dail at an early date.

The View of the Irish Medical Committee.

Dr. Rowlette, speaking on behalf of the deputation, said that although the forthcoming election might seem to make their visit untimely, they thought it right, when the Minister was willing to receive them, to make their views known. It was understood that the Department had been at work on a draft for a Public Health Bill; no measure would be adequate unless it was thorough-going, as the condition of Ireland gave cause for anxiety. The death-rate in other countries had fallen greatly in the past 60 years; in Ireland it was practically stationary; the mortality from tuberculosis had fallen in Great Britain by more than a half, in Ireland by only a third. Infant mortality in Ireland as a whole was not high, a fact observed in all pastoral countries, but in the Irish cities it was alarmingly high, Dublin having the highest infant mortality in the British Isles—134 per 1000, as compared with 80 per 1000 in London. Less care was paid to public health in Ireland than in any civilised country in the world; in the whole of the Free State there was only one whole-time medical officer of health—the officer for Dublin. In country districts sanitary work, in the modern sense, hardly existed. The dispensary doctor was medical officer of health for his district as well as dispensary doctor, and for the duties of this added office he was paid a separate salary, which varied in different districts from £5 a year to £30; rigorous attention to preventive work was thus made impossible.

The deputation urged the Minister to accept in its entirety the programme of the Irish Public Health Council, which had been accepted by the medical profession and by the press and had recently in its essentials been put forward by the General Council of County Councils, a body thoroughly representative of the ratepayers of the country. The central features of the programme were the establishment of a Ministry of Health and of a National Medical Service. The Irish Medical Committee saw no hope of making the public medical services attractive to the best class of young Irish medical men and women by any other means than by the establishment of a national medical service. The profession had welcomed the reforms carried through by the first Dail and on the proposals of the Minister, but they did not go far enough, save in one particular, the abolition of district hospitals, where, indeed, the changes went too far. The establishment of the county as the health unit was a great advance. The Irish Medical Committee thought that the setting up of a body such as the Irish Public Health Council, or a health council such as was recommended in the report of the Irish Public Health Council, would be helpful to the Minister.

Reply of the Minister of Local Government.

The Minister stated in his reply that in view of the early dissolution of the Dail it would be impossible for him to adhere to his intention of introducing a Public Health Bill, but he hoped that it would be one of the first measures to be introduced after the election. He fully realised the unsatisfactory condition of health questions in the Free State; it was his intention to deal with public health before undertaking the reform of the medical services. He proposed to appoint a medical officer of health for each county, with school medical inspectors and tuberculosis medical officers under him. He hoped that such salaries would be paid as would attract the best young doctors in the profession in Ireland. He did not favour the establishment of a Ministry of Health apart from that of Local Government; he considered it was only a difference in nomenclature which in practice meant very little. He favoured the formation of an advisory body similar in functions to the existing Irish Public Health Council, but thought that the question of a national medical service required further consideration. The deputation then continued the discussion with Mr. McCarron, Secretary of Local Government, and Dr. E. F. Stephenson, Medical Administrator.

Mr. O'Maille, T.D., brought forward the case of the Co. Galway doctors, especially those in the Connemara district, and protested against the action of the Local Government Department in refusing to sanction the full amount of £300 per annum for dispensary doctors in Co. Galway. Two representative practitioners from Connemara stated that their districts were 20 miles in length and 15 miles in breadth; one of them mentioned that the population of his district was over 8000, that as many as 80 per cent. of these were treated gratuitously under the Medical Charities Acts, and that to give sufficient attendance to the sick in his district he would have to be paid more than double his present remuneration to cover travelling expenses.

The deputation discussed at considerable length other questions concerning the Poor-law Medical Service—viz., inadequate salaries, arrangements for holidays, and fees for occasional services.

UNITED STATES OF AMERICA.

(From an Occasional Correspondent.)

Passing of Another Pioneer.

Within a few weeks of the death of Dr. Hermann Biggs, reported in my last letter, New York has lost another of her medical pioneers by the sudden death from heart failure of Dr. John H. Pryor, head of the board of directors and physician in chief at the Perrysburg Hospital. He was the founder of Ray Brook Sanatorium, the first public institution for the exclusive treatment of tuberculosis in this country, and situated only a few miles from the Trudeau Sanatorium at Saranac Lake. Afterwards, at Perrysburg, he turned his attention to the treatment of surgical tuberculosis by heliotherapy and artificial light, and developed an institution worthy to be compared with those of Sir Henry Gauvain at Alton or of Dr. Rollier at Leysin. Dr. Pryor was also one of the founders of the National Tuberculosis Association. He was 62 years of age.

Control of Urine Sugar under Insulin Treatment.

The importance of avoiding dangerously low sugar excretion has been amply demonstrated during the early experience with the treatment of diabetes by insulin. Mr. Irvine H. Page, of the Eli Lilly Research Laboratories, reports a method[1] for which he claims both simplicity and accuracy, with the additional advantage that it can be used for determining slight excess of sugar excretion in "borderline diabetes." This method consists in hourly sugar determinations throughout the day (7 A.M. to 7 P.M.), and a further test of the 12-hour combined night urine, by the Benedict-Osterberg method.[2] Mr. Page's experiments showed that the curve of normal sugar excretion is remarkably constant with a slight upward trend from morning to evening, and a low level during sleep. During the hour following meals there occurs a sharp rise which is in no way dependent upon the quantity or quality of food ingested. Great variations and remarkable constancy of sugar excretion may be found at different times in the same individual. Mr Page fixed as the upper limit of a normal curve 110 mg. of sugar in the hour. Among his supposedly normal subjects, towards whom no suspicion of glycosuria had ever been entertained, there were some who considerably exceeded this allowance, which leads Mr. Page to the conclusion that the method is likely to prove valuable for the determination of unsuspected glycosuria. It is, however, a little elaborate as a routine test. There can be no doubt, on the other hand, that it will give valuable information during insulin treatment. Mr. Page considers that the lower limit of safety in a patient undergoing insulin treatment is 30 mg. per hour. Fortunately the amount of insulin required to reduce "normal urine sugar" to a dangerously low level greatly exceeds that needed to reduce pathological wastage, but this fact does not excuse the administrator of insulin from taking every precaution to avoid a dangerous hypoglycæmia.

VIENNA.

(From our own Correspondent.)

Insulin Treatment in Vienna.

At a recent meeting of the Vienna Medical Society the insulin treatment of diabetes was discussed, and Prof. Falta described his experiments made in order to obtain the active substance. The animals used were dogs, fœtal calves, fish, and latterly sheep, pigs, and oxen. The results of the treatment are very encouraging. Large doses are necessary, each dose being equivalent to the quantity of insulin required to diminish by 50 per cent. the blood-sugar in a medium-sized rabbit. The employment of insulin is not free from risk; excessive doses produce hunger, fatigue, spasms, loss of consciousness—symptoms best treated by intravenous injections of grape-sugar. Other Viennese observers have also had excellent results with this remedy. Rapid improvement of patients in a comatose condition was seen several times. The excretion of sugar and acetone can be promptly reduced to a fraction of the regular output. Insulin cannot supersede the dietetic treatment of diabetes, but the new method is a most welcome addition to the physician's equipment. Insulin is being prepared in three laboratories in Vienna, as it is too expensive to be imported from abroad. Physicians are agreed, however, that the English product is much better than that hitherto obtainable here. Dr. Pollak pointed out that the increase of weight noted in patients submitted to that treatment is due to water-retention in the tissues, and that all patients benefit by being allowed fat and carbohydrates.

Influence of Diuretics on Water Content of Tissues.

Dr. Saxl has investigated the influence of diuretics upon the tissues in healthy and diseased persons in order to clear up the conflicting evidence found in the literature of the subject. As a rule, healthy tissues are only slightly affected; theobromin, for instance, does not increase the flow of urine in children (Hecht), whilst novasurol is very effective. In œdematous patients diuresis was supposed to be produced by direct attack upon the œdematous tissue. Experiments by Schur show, however, that purin bodies do exert a very definite action on healthy kidneys; Schur thinks that they act chiefly on the kidney and not by mobilising the water contained in the tissues. In a recent discussion on this problem at the Vienna Medical Society all these hypotheses were brought forward; the majority of the investigators agreed that the chief burden is assumed by the kidney. All diuretics should be capable of stimulation of the function of the kidney. The idea that water might be "drawn out" of the tissues cannot now be upheld. It is the vis a tergo which causes large anasarca to disappear under the influence of a diuretic remedy, increased pressure by improved heart action being one of the chief factors. The influence of the nervous system upon the kidney must not be lost sight of, ecause the same remedy acts in one case and fails to ct in another.

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[1] The Journal of Laboratory and Clinical Medicine, July, 1923, p. 631.

[2] Reported in Jour. Biol. Chem., 1921, xlviii., 51.

General Systemic Effects of X Rays.

The effects of X rays upon the general condition f patients who had for various reasons received rge doses of them were recently studied in Prof. chlesinger's clinic. In nearly every instance marked ebility and malaise appeared similar to that following itoxication, and sometimes so severe as to give the ppearance of shock. This condition, expressed y an abnormal distribution of blood and changes the permeability of the blood-vessels, was quickly nproved by hypertonic solutions of sugar, NaCl r Na_2SO_4, this being very similar to improvement bserved in actual shock. Further investigations ave shown that not only is NaCl largely eliminated om the blood after a strong dose of X rays, but lso that the concentration of potassium, calcium, nd cholesterin in the blood is profoundly altered, hile the blood-sugar reacts sharply. Lymphatic ssue is also severely affected, and the products of his disintegration are no doubt partly responsible r the symptoms of intoxication after X ray application. Every exposure to X rays which penetrate rough the superficial layers must, therefore, be garded as a systemic injury first manifested by the ansportation of NaCl from the blood to the kidneys nd thence out of the body. One of the organs rimarily affected is the liver, which soon shows arenchymatous changes. This organ may be "absotely insufficient" to deal with the work thrown pon it even by a small quantity of X rays, or relatively insufficient," if an intensive dose has used a large amount of disintegration products be circulating in the system. The liver may thus e seriously affected, not by the rays themselves, ut by the metabolic changes caused in the blood. he normal function of other glandular organs may so be seriously hampered after an X ray application the body, but all evidence points to the liver as the ief sufferer, hence the malaise and prostration so ften complained of after X ray sittings. The change in lt concentration is only part, however, of the damage one to the system; it is readily counteracted by iving the patient an adequate dose of NaCl, whilst her damage is not yet easily recognised or treated.

July 31st.

BUDAPEST.

(FROM OUR OWN CORRESPONDENT.)

Treatment of Terminal Hæmaturia.

IN a recent number of the *Gyógyászat*, Dr. Kertész, Budapest, dealt with terminal hæmaturia as e of the most obstinate symptoms of gonorrhœa. his hæmaturia always occurs after micturition, and sults from the strain which serves to express the last rops of urine. The blood exudes from wrinkles rmed between the bladder and the urethra, which rinkles are exposed, about the end of micturition, to certain tension; their epithelial surface is mostly coriated, and during the frequent contractions nnected with pressure they void a few drops of ood. Methods of treatment hitherto applied—rest bed and instillation of silver nitrate—are frequently no avail. Another more efficacious method consists letting the patient micturate in a half-recumbent sition, instructing him when the act is nearly ncluded to relax muscular pressure and to press the ladder hard with the hands. In this way the last rops of urine are expressed. This method is very rviceable, often relieving the patient from terminal ematuria in a few days.

Neosalvarsan in the Treatment of Chorea.

Dr. János Bókay, professor of diseases of children the University of Budapest, has lately administered eosalvarsan in severe cases of chorea with excellent sults. A striking relief of incoördination a few days ter the first intravenous application of neosalvarsan, and disappearance of the intense nervous restlessness in every instance after the second injection—i.e., after ten days—have been observed. The quantity of neosalvarsan given varied; Dr. Bókay used a dose of 1 g. on an average. Up to now, chorea in a child of "middle" age could generally be cured by oral application of some 300 drops of Fowler's solution, with an arsenic content of about 0·12 g. The arsenic content of 1 g. neosalvarsan is 0·217 g. Prof. Bókay attributes the rapid effect of the latter not to the greater arsenic content, but to the fact that the arsenic in the neosalvarsan is organic and also lipotropic, making possible the penetration of the arsenic into nerve tissue.

Death of an Eminent Ship's Surgeon.

Dr. Francis Gáspar, who died recently, was well known for his books of travel, and served about 40 years with the late Austro-Hungarian marine as a ship's surgeon. He published his experiences in two large works. "Seven Years on the Sea," and "Forty Thousand Miles with Steam and Wind"—i.e., 200,000 English miles—both of which were translated into several foreign languages. After the war, when the Austro-Hungarian marine service disappeared, Dr. Gáspar accepted the offer of an important post in the Hungarian Public Health Department, but found the work distasteful, and became embittered to such an extent that he committed suicide.

A Wheat Currency.

The Hungarian doctor's livelihood at the present time is precarious, especially in the provinces, where a village practitioner's annual income rarely exceeds 100,000 kronen (at present equivalent to something over 45*s.*). The instability of the economic situation has led the local branch of the Medical Association at Szabolcs to introduce a new system of payment of medical fees. The fee for a consultation is to be the current price of 5 kg. of wheat. Even this very moderate fee will be reduced for officials, clerks, &c., whose salaries do not vary with the fluctuations of the price of wheat.

Census Figures.

The Central Statistical Bureau has just published the data yielded by the last census. Hungary is stated to have had 7,980,143 inhabitants in 1920, which figure represents a 5 per cent. increase against 1910 in the present Hungarian territory. This increase of population, despite the tremendous loss of life in the war, is due to the influx of people from the lost portions of the old Hungarian kingdom. Another result of the war was that the male population numbered 3·8 millions and the female population 4·1 millions. The number of widows in the country was 25 per cent. larger than in 1910, and the number of divorces had increased by 55 per cent.

Child Welfare Exhibition.

On July 16th the first Hungarian Child Welfare Exhibition was opened in Budapest. The exhibits were divided into various groups—hygienic, educational, &c. A large collection of apparatus for the correction of deformities, a number of skulls of children from the pathological museum of the pædiatric clinic, a series of models illustrating the different infections of childhood, and statistics relating to children's accidents were among the most interesting features of the exhibition.

July 27th.

THE LATE DR. J. R. STENHOUSE.—The death occurred at St. Andrew's-place, Lewes, on August 10th of Dr. John Robert Stenhouse at the comparatively early age of 52. Dr. Stenhouse received his medical education at Guy's Hospital, becoming M.R.C.S., L.R.C.P. Lond. in 1894, and B.S. Lond. in 1895. He secured the diploma of Public Health in 1904 and obtained the degree of M.D. (qualifying for medal) in 1907. Dr. Stenhouse held a number of appointments at Lewes, including those of school medical officer and medical officer of health, but ill-health compelled him to relinquish the latter post some years ago. He was an occasional contributor to the medical press.

BRITISH MEDICAL ASSOCIATION.

ANNUAL MEETING AT PORTSMOUTH.

(*Continued from p. 304.*)

SECTION OF MEDICINE.

Wednesday, July 25th.

In opening the discussion, before a crowded audience, on

Diabetes,

the President, Sir Thomas Horder, said that the committee of the section had had no difficulty in choosing the subject of the first debate. If insulin were not discussed our patients would be much surprised, and with good reason, and they would probably assume, and again with reason, that we were quite satisfied that in insulin we possessed a "cure" for diabetes and that nothing more need be said on the subject. Many persons had already assumed this in view of certain generalisations which, if they did not carry the hall-mark of authority, had not been authoritatively contradicted. It was notoriously difficult to control popular ideas about new remedies, and the very fact that such epoch-making events as the discovery of insulin were rare, when they did come, took popular credence further than facts justified or the discoverer claimed. The problem was regarded as already solved, whereas it might well be that insulin would prove to be as great an asset to medical science by assisting the interpretation of obscure phenomena as in the provision of a therapeutic agent. Had not the essence of the problem of diabetes been the almost certain fact that we were dealing not with one biochemical change but with several? Certain cases of diabetes were benefited much less by insulin than were others, and certain would be found not to be benefited at all; this position must be made quite clear in our patients' interest.

Some very fundamental questions, Sir Thomas Horder continued, will be discussed, and we shall hear the opinion of men well qualified to speak upon them. Will some of the cases of diabetes that show such striking improvement under treatment by this remedy recover their lost power of maintaining a normal blood-sugar so as to "carry on" without its help? Is diabetes necessarily a progressive disease? At what level should the blood-sugar be maintained in order that insulin should be most effective? Will blood-sugar estimations continue to be necessary in every case, and, if so, are either of the rapid methods at present in use practicable and accurate for the general practitioner? Will it be a safe criterion by which to control an increase in the patient's diet to adopt the estimation of urinary sugar? Can any general guide be given as to the best proportions of the main food principles which it is wise to employ in venturing upon an increase of diet when, by the use of insulin and by starvation, the blood-sugar has kept within a normal range for several days, or must each case be regarded as a law unto itself? Is there not a hope that the active principle of insulin may be isolated so that it may be effectively given by the mouth? We shall doubtless hear of the abuse of insulin by the greedy glycosuric and of the undesirable symptoms produced by the use of insulin in cases of renal glycosuria. It would be a vain request to ask that in this discussion some consideration should be given to other aspects of diabetes than those concerned with insulin: the relation of sepsis to diabetes, the ultimate causation of pancreatic cases, the influence of infection and heredity. Insulin is probably the greatest contribution yet made to the study of diabetes. The section extends a very hearty welcome to Dr. Banting, and he will be asked to speak first. If he has anything new to tell us we shall be very interested to hear it. If he has nothing new then we shall like to hear the old story again from his own lips.

Dr. F. G. Banting (Toronto) said that he and those associated with him in his work thanked the medical profession for the way in which it had received the result of their experiments. He outlined the story o the research which led to the preparation of insuli in quantity. Following ligature of the pancreati ducts the acinous cells of the gland degenerate, bu the islet cells remain intact. They had ligated th ducts in a dog and ten weeks later removed th degenerate pancreas and extracted it with saline The injection of this extract into a diabetic dog cause a fall in the animal's blood-sugar and it lost it ravenous appetite. The amount of pancreas s obtained was very small. The injection of secretin t exhaust the acinous cells was found to be ver uncertain in its results. Up to the fourth month o intra-uterine life the acinous cells in the fœtal cal contain no trypsinogen granules. An extract of thi material was found to be very active in lowerin blood-sugar. An attempt was then made to extrac whole pancreas with some chemical substance whic would destroy trypsin but leave insulin unharmed 82 per cent. alcohol was found to answer the purpose Since then rapid progress has been made and th product is now protein-free, is non-irritating, and easil standardised. In the laboratory insulin in prope dosage reduces the blood-sugar to normal or less renders the urine sugar-free, and by its use the lif of a depancreatised dog can be greatly prolonged. Insulin also enables the liver to store glycogen. In adequate doses insulin will control all forms of hyperglycæmia.

Clinically there is no fixed method of managin diabetic patients. In Toronto a case, if at all severe, is admitted to hospital for at least three weeks' training and the working out of sugar tolerance. The patient is kept on his usual diet for 24 hours and then upon the "basal requirement diet"; 0·75 g. of protein per kilo body-weight is given to an adult pe diem, the remaining calories are made up of carbohydrate and fat. A mild case on this diet becomes sugar-free; if severe the output becomes more constant. If the patient can take 500 calories over and above the basal requirement insulin is not given. The suga output is of value in estimating the initial dose of insulin. One unit will metabolise from 2 to 2·5 g. of carbohydrate in a severe case and from 5–6 g. in a mild case. As a rule, 5 units may be given to begin with unless the patient is comatose. The dose should be given one hour before a meal once a day. It is advisable to keep the patient sugar-free, as in that state the pancreas tends to produce insulin. In many cases there is evidence of increasing tolerance as a result of treatment with insulin. The frequency of blood-sugar estimation necessary to control treatment is still uncertain.

Dr. P. J. Cammidge (London), after expressing his personal admiration for Dr. Banting's work, said that for many years the name diabetes mellitus had been applied to any condition of glycosuria. It was now possible to determine with considerable certainty whether the symptom depended on failure of the pancreas or was due to other known causes of hyperglycæmia. Clinically the prognosis and reaction to treatment of the various types was different. He had applied the test of "hydrolysis and difference values" of the blood to its sugar content before and after a standard breakfast. In this test the blood-sugar is estimated in one sample and in another the reducing power is determined after being freed from protein and hydrolysed. The latter gives the "hydrolysis value" and the difference between the two is the "difference value." By this means three types have been differentiated, characterised respectively by deficiency of the internal secretion of the pancreas, hyperactivity of the thyroid, pituitary or nervous disturbances, and defects of carbohydrate storage in the liver. Combinations of these types were met with, but deficiency of islets develops in all untreated cases of hyperglycæmia. Insulin may be used in treatment in three ways: as a temporary aid to metabolism in emergencies, to enable a patient to take a diet in excess of his natural tolerance and as a remedial measure. It is not a universal cure for diabetes, but is the most valuable means we have for ontrolling metabolic defects due to deficiency of he internal secretions of the pancreas and should not e given indiscriminately to all cases of glycosuria.

Dr. **George Graham** (London), speaking on the esults of experiments on patients in the medical rofessorial clinic at St. Bartholomew's, said tolerance ould be recovered to a certain extent by resting the let cells. It was of the utmost importance to make ertain that as a result of treatment the blood-sugar as normal in the morning before the daily dose of sulin was given and no carbohydrate beyond that the vegetables must be added until the morning lood-sugar had been normal for three or four weeks. the blood-sugar was 0·2 per cent. or 0·15 per cent. e islet cells were overworked and had no chance to pair. In order to produce this a varying dose will e required in different individuals; in some 10 to 15 nits a day would suffice, in others 30 to 50 units even vice a day might be required. Blood-sugar estima- ons were of assistance, but not absolutely necessary; long as glycosuria occurred they could be dispensed ith, but when the urine was sugar-free it was im- ortant to make estimations occasionally as there was o other means of telling whether it were 0·10 per cent. r 0·18 per cent. Blood should be collected either efore the insulin injection or 12 hours after. It was etter to estimate the blood-sugar at once, but the lood might be collected and preserved by the addition potassium oxalate and one drop of 40 per cent. rmalin. Results of treatment in cases of coma were, far, fairly good; two recovered and one died. It as important to hunt for sepsis in every case; the tal case had a parotid abscess. In coma 20 to 30 nits should be given subcutaneously at once; it was nnecessary to give sugar if the patient was passing uch sugar, but if very bad 50 g. of sugar and 60 units insulin should be given at once, and as much as 140 nits may be required in 24 hours.

Dr. **J. A. Nixon** (Bristol) said he had treated five ses of diabetes with insulin, and spoke enthusiastic- lly, though perhaps prematurely, as to its value. as a patient any better, he asked, for being sugar- ee when he had a high blood-sugar? The patient ay gain in weight and well-being, but was he safe? glycosuria occurred with a low blood-sugar threshold e could make use of a trace of glycosuria as a guide insulin dosage. Symptoms due to hypoglycæmia ere difficult to determine. A man of 40 received units of insulin daily for three days and then ddenly developed partial aphasia; he was given ucose and speech improved the next day, but as he ad had angina pectoris the aphasia may have been vascular origin. Another man, aged 35, receiving units complained of tingling in the legs and swelling the feet though his blood did not show hypo- ycæmia. The "basal requirement diet" was the ost practical standard diet (Woodyat formula), hich enabled insulin dosage to be adjusted to a diet hich was adequate.

Dr. **John Rennie** (Glasgow) contrasted the results treatment of a series of cases under the old, the llen-Graham, and insulin methods of treatment. n improvement may be expected in the majority eated by the Allen method, but end-results were far om satisfactory. Ten cases treated with insulin owed distinct improvement. To determine the quisite dose of insulin each patient was given a eal of known carbohydrate protein fat content with creasing doses of insulin until satisfactory blood- gar and urinary-sugar results were obtained, and om this a sufficient dose for an adequate diet was lculated. This method was best suited to chronic ses with low carbohydrate tolerance. There was experimental evidence to show that insulin was sorbed through the skin.

Dr. **E. P. Poulton** (London) said that in certain ses a distinct increase of tolerance had been observed ter prolonged treatment with insulin.

Dr. **O. Leyton** (London) referred to the curative operties of insulin in diabetes of comparatively cent origin and due to pancreatic defect. When there was a probability that damaged islet cells were present an attempt should be made to restore them to health by rest—i.e., giving enough insulin to make blood-sugar below rather than above normal; if symptoms of hypoglycæmia result they may be controlled by the administration of sugar.

Dr. **A. P. Thomson** (Birmingham) had observed a definite increase in tolerance in two cases that had previously been vigorously dieted for some time. Blood-sugar estimations were essential when giving large doses of insulin, but treatment can well be carried on without in the average case if the urine were examined frequently and the diet properly controlled. A few estimations were necessary during a preliminary period of standardisation.

Dr. **Frank Roper** (Exeter) related some recent experiences with insulin, and Dr. **E. E. Waters**, I.M.S., and Dr. **A. Clarke Begg** (Swansea) took part in the discussion before Dr. **Banting's** reply.

THURSDAY, JULY 26TH.

On the second day the section, under the chairmanship of Dr. **J. Odery Symes** (Bristol), discussed

Heart Disease in Early Life,

its ætiology, prevention, and treatment. Dr. **Reginald Miller** (London) said the matter was of prime importance for the people of England. The subject resolves itself largely into the consideration of one disease, and that is acute rheumatism. In reviewing the progress made in the fight against this disease the chief change in the last 50 years seems to be a reduction in the frequency of its severer manifestations; hyperpyrexia, the most dread of all rheumatic symptoms, seems to be disappearing, and the number of cases of rheumatism sufficiently severe to require admission to hospital is also declining; in the last 50 years the admissions have dropped 50 per cent., according to the statistics of some London hospitals. The incidence of acute pericarditis as judged from the same tables is also declining. Some progress, therefore, appears to have been made, and it is due rather to clinical work than to public health administration; earlier diagnosis and more efficient treatment being in the main responsible. But rheumatism still remains one of the serious infections of this country, and the factors hindering progress are numerous, and may be considered under three headings.

1. *Problem of Rheumatic Infection*—the most important. The modern view is that it is a specific infection producing no sort of immunity against itself. A disease reproducing the same clinical picture again and again must be due to one type or strain of microbes; the histopathology proves the bacteriæmic character of the infection and supports its specific nature. To gain more knowledge as to the influence of the rheumatic environment it might be of service to make rheumatism a notifiable disease, and education of parents and school teachers would further our efforts to get the rheumatic child under treatment as early as possible. As to the specific organism, the view was expressed that it is an alimentary streptococcus, one fact brought forward in support being the isolation of such an organism from the cerebro-spinal fluid in a case of chorea. The action of salicylate was discussed and the view expressed that it exerted a bactericidal action; the effective dose in children is from one to two drachms a day divided into many small doses. As to the origin of the recrudescences of the infective process and reinfection of the rheumatic, early attacks may often be traced to the tonsils and tonsillectomy may do good, but the source of later attacks is often wrapped in mystery. The tests of cure are the loss of the toxic appearance, a gain in weight, and a flat temperature chart.

2. *Problem of Heart Disease in Rheumatic Subjects.*—Heart disease in rheumatism is largely a matter of the severity of the infection and the age of the child; below 12 rheumatism is essentially an infection of the heart. The severe symptoms often develop with a

rush, yet they are nearly always preceded by mild symptoms. The activity of the infection must be subdued by salicylate, while sparing the heart by rest, early diagnosis, and efficient treatment.

3. *Problem of Cardiac Crippling in Rheumatic Heart Disease*—the chronic heart invalid. The heart muscle loses its power of recovery. It is infection rather than mechanical strain that has done the harm; the child's heart never breaks down by mechanical strain alone, and these cases of chronic cardiac disease are the result of repeated infections. In preventing and treating chronic cardiac insufficiency reliance must be placed on the persistent use of salicylate in the hope of preventing recrudescences of infection, the use of digitalis when indicated, and removal of tonsils obviously diseased. Vaccine therapy, even as a prophylactic, in spite of recent reports with *S. viridans* from America, is most disappointing. With children too toxic to react the infection produces no immunity to itself. Sir A. E. Wright's new method of transfusion with immunised blood may be well worth a trial. The provision of prolonged quiet rather than strict rest, correct hygiene, close medical supervision, and some facilities for education should be aimed at. The most urgent problems awaiting solution are: (1) What is the underlying connexion between rheumatism and poverty? (2) What is the origin of repeated relapses and how can they be prevented? (3) How can we give long courses of treatment to our many heart cripples?

Dr. G. A. **Allan** (Glasgow) said that in 1921 53,710 deaths, or 11·7 per cent. of deaths at all ages from all causes in England and Wales, were due to heart disease. Rheumatism accounts for about half to one-third of deaths due to heart disease in a general hospital. In Glasgow, with a population of 1,111,428, the education authority is responsible for 198,304 children, and in routine examination 0·6 per cent. had acquired organic heart disease, and 1·1 per cent. functional heart disorder. In London 4 per cent. of girls and 3 per cent. of boys of 12 years of age have a cardiac disorder. There must be between 45,000 and 50,000 children attending school in Great Britain who have organic heart disease, many of whom are destined to become cardiac cripples before middle life. The percentage of cases doubles during the compulsory school age. Rheumatism was an infection, but an organism did not necessarily have to be seen before it could be fought. Was tonsillitis a rheumatic manifestation, or was the tonsil the site of entry or the home of the organism? Did scarlet fever ever produce heart disease or predispose to rheumatic infection? With our present knowledge some education of parents was possible. Many do not realise a child could have rheumatism. Education of students should be more thorough, and they and practitioners should realise that treating rheumatism by pharmacopœial doses of salicylate is only playing with a serious disease. End-results of rheumatism as seen in general hospitals were very seldom the result of only one attack; cases of pericarditis in a first attack do not as a rule live long. We wanted to know the habitat of the organism and the predisposing factors to the disease. A committee linking up various workers would be in a position to influence medical and lay opinion in the direction of most useful activity. It was proposed that the council of the association be recommended to appoint a special committee to consider the best steps to be taken to combat the grave menace to the community arising from chronic cardiac disease.

Dr. J. G. **Emanuel** (Birmingham) said that to a child suffering from organic heart disease the danger is not from over-exertion but from re-infection. Rheumatic carditis demands rest in bed. If no active infection was present a damaged heart required exercising. Rheumatic carditis often ran an afebrile course. Anæmia might be too slight to be a guide, and the same holds for the loss of weight. Physical signs, with the exception of pericardial friction, did not help us to recognise active cardial infection. A pulse-rate over 100 when the child was at rest in bed, especially if not slowed by digitalis, indicated active infection. Re-infection did not take place through the tonsil. Rheumatism in children closely resembles tuberculosis; in both repeated infection took place from existing foci within the body. Salicylate had not diminished the incidence of rheumatic carditis; it relieved pain and pyrexia in this and other conditions. There was a danger in its administration, in that by relieving pain and fever the child might be allowed up too soon. Hospitals, auxiliary to existing general hospitals, were badly required where children might lie until all infection was over.

Dr. **Carey Coombs** (Bristol) protested against Dr. Emanuel's anti-salicylate views in the treatment of cardiac rheumatism. Mortality records of Bristol proved the incidence of fatal cardiac rheumatism to be less than it was; in that city about 80 deaths occurred each year—in each case death might be preceded by, perhaps, ten years' crippledom. He welcomed Dr. Allan's resolution. Many cases of cardiac rheumatism became relatively cured, but the valve was always damaged and liable to become the seat of chronic ulcerative endocarditis. He warmly endorsed Dr. Emanuel's plea for treatment in auxiliary hospitals in coördination with existing teaching hospitals, and thought much might be done at once if Poor-law infirmaries were more readily available for the purpose.

Dr. W. H. W. **Attlee** (Eton) said that in public schools hearts crippled by rheumatism were very rare, but large numbers of functional hearts were met with wherein abnormal signs were found in the course of routine examination but which gave no symptoms. Variation from the normal physical signs in the heart of a rapidly growing boy meant very little in the absence of symptoms. Restriction of games in such cases does harm to the patient, and school life is spoilt to a great extent. He had followed up many cases which had hearts of this kind at school, and none had shown cardiac symptoms since leaving school.

Dr. M. O. **Raven** (Broadstairs) said that fresh air was necessary, and ordinary convalescent homes were too noisy for the treatment of children with heart disease. In rest homes at the seaside one had to decide how long a child was to be kept in order to prevent recrudescence. In New York it was considered that the child was not free until three years had passed without relapse. Of cases treated at Broadstairs 19 had been traced through periods of 18 months; these had remained for periods varying from six weeks to 12 months and were re-examined after living active lives in London for at least seven months. The result suggested that children were subject to relapse in proportion to the shortness of their stay in the country. Every child who ever had symptoms of the rheumatic state should be sent into the country for six to eight months before being re-exposed to the environment in which the disease was originally contracted. Routine rest was always to be deprecated. Rest is needed solely if infection was in the heart. A systolic murmur often disappeared with rest. A diastolic bruit at the apex was very common in children with active heart disease; its first manifestation was a reduplicated second sound which gradually became a mid-diastolic bruit and finally a pre-systolic murmur. On rest the murmur might recede completely. Until change in physical signs has ceased rest must be enforced.

Dr. F. G. **Layton** (Walsall) said that when patients were ordered by a hospital physician to bed for a month on account of rheumatism the general practitioner should be written to and asked to enforce that treatment and the administration of salicylate. What was the evidence that growing pains were due to rheumatic infection? Morbus cordis undoubtedly followed scarlet fever and diphtheria. Heart disease in children was much commoner in the back streets and far more hospital accommodation was wanted.

Dr. C. O. **Hawthorne** (London) emphasised the importance of prophylactic efforts, but did not approve of leaving propaganda work to a special committee and thought it should be done through the general practitioner. There were two pictures of rheumatic infection, the adult and the child—rheumatism in adults compels rest on account of arthritis, but the non-arthritic rheumatism of childhood did not enforce rest and for purposes of prevention rest must be secured. Leaflets for propaganda purposes were useless.

Dr. A. P. Thomson (Birmingham) reviewed his personal experience during the last two years in dealing with the problem of the rheumatic child at the Barberville institution in Birmingham—a residential school for cripples wherein some 50 per cent. of the beds were allocated to rheumatic cases. The outstanding clinical difficulties were two: to determine when the cardiac infection had become quiescent and when the child became free from the danger of re-infection. Cases of chorea did better when special educational methods were employed than when they did not go to school. By varying the daily amount of rest he found that one group, if rested for 18 hours in the 24, developed a more rapid pulse than those who were up; if a child was put to bed and his pulse-rate rose he should be exercised. Carditis does not develop when weight is going up. Rheumatic cases should be certified and treated in special institutions in touch with the medical schools.

Dr. E. J. Moffett (Birmingham) said that the type of case met with now was milder than in the nineties. As a school medical inspector she found difficulties in diagnosis between the effects of tubercle and rheumatism. The Birmingham mothers are well up in all symptoms of rheumatism. Treatment in the poorer classes was unsatisfactory. Severe cases are admitted to hospital; in less severe cases home treatment was attempted under the supervision of a school nurse. Long periods of continuous treatment are required. Education was important; rheumatic children were backward from prolonged absence from school and should be taught separately in smaller classes on a modified Delton plan. The gap between the curricula between the infant and other schools was too wide.

Sir Thomas Horder commented on the significance of the diastolic bruit in rheumatic heart disease, tressing its importance as a premonitory sign of mitral stenosis. Mitral stenosis differed in its evolu-ion from mitral regurgitation; the latter resulted rom acute endocarditis, a complication of rheumatic ever, whereas most cases of mitral stenosis followed not an acute endocarditis but a chronic, often afebrile, ometimes subacute, rheumatic process. Mitral regur-gitation was a vegetative affair of the cusps; stenosis n infiltration of the valve.

Dr. G. J. Langley (Manchester) said that the ecognition of subacute rheumatism in children might be exceedingly difficult. He drew attention to the parallelism between tuberculous and rheumatic nfection; both might improve on graduated exercise, hough the response to effort of the rheumatic treptococcus and the tubercle bacillus was not the ame. The response of the rheumatic patient to uto-inoculation was recognised in the form of a ecrudescence of the disease; in tubercle the response was often recorded on the temperature chart.

Dr. C. F. Routh (Southsea) commented on the ifficulty of tracing the origin of valvular defects in dults who were not aware that they had organic eart disease; a child's heart had an extraordinary ecuperative power. Acute rheumatism was very are in private practice.

Dr. R. Whittington (Hove) agreed with Dr. ttlee that properly regulated exercises were greatly o be preferred to forbidding games to boys at school.

Dr. Miller, in reply, said that he thought Dr. ttlee's cases were not infected or poisoned hearts nd should be treated on a nervous rather than a ardiac basis. Swimming was not good exercise for unctional cardiac disorders. Agreement was general s to the value of salicylate and the necessity of rest or the infected heart, and he was glad that the meeting felt the time had come for some investigation nto the rheumatic problem to be made.

Friday, July 27th.

On the third day Dr. G. A. Allan was in the chair and Dr. J. J. Perkins (London) opened a discussion on

Chronic Bronchitis.

The subject, he said, had been chosen at the request of the branches on account of the frequency of these cases in practice and their high death roll—1010 persons per million living (R.G.'s figures for 1920). Dr. Perkins outlined the main predisposing causes—trade and occupation, climate, local pathological conditions especially in the upper respiratory tract, general constitutional factors. There was a distinction between recurrent bronchial catarrh and a single acute attack of bronchitis, which latter may occur without special predisposing conditions, and for which ordinary drugs were useful and vaccines truly curative. When catarrh is constant vaccines were more efficacious in relieving such symptoms as cough or spasm than in curing. Chronic bronchitis was usually secondary to some chronic pre-existing disease, especially of the upper respiratory tract, from which infection of the bronchi by inhalation could easily take place, and the eradication of this underlying condition was essential to the successful treatment of the bronchi. In other cases metabolic conditions were predisposing factors—obesity, overfeeding, and alcoholic excess. Treatment should be continued until a satisfactory convalescence was secured. The open-air habit of life should be preserved or restored and a good plan for the bronchitic was to take his annual holiday in the winter at a place where outdoor exercise is pleasant. The conditions of life in office and home could be improved and heated stuffy atmospheres abolished. A valuable adjunct was respiratory exercises such as those systematised by Mr. C. MacMahon at St. Bartholomew's Hospital, the object of which is to restore and increase the movement of the lungs.

While not undervaluing our present methods of treatment, Dr. Perkins suggested, in conclusion, that important predisposing conditions were often present, the treatment of which was essential; that medicinal measures did not cover the whole ground; that it was important by pure air and exercises to increase the functional activity of the lungs. By removing foci of infection much could be done to prevent catarrh. After an attack much could be done to defend the patient from becoming a chronic bronchitic by enjoining the value of fresh air and exercise of the lung.

Dr. Symes discussed the bacteriology and vaccine treatment of chronic bronchitis. In the infective varieties reports were universally favourable; cases were never made worse. He was opposed to the use of stock vaccine, and mixed infection being the rule an autogenous vaccine was highly desirable. The exciting organisms were constantly present in the nose and may be isolated by means of a nasal swab when sputum cannot be satisfactorily obtained. The dose must be sufficient to excite a reaction and repeated every five to seven days. In the interval between attacks stock prophylactic vaccine might be given.

Dr. Michael Foster (Harrogate) described climatic treatment abroad. The first question was, Can the disease be arrested? Too little consideration had been given to these early cases drifting into lifelong bronchitis, and in these early cases climatic treatment enables habits of coddling to be set aside. Dry air lessens secretion and the diminished air pressure of the Alps dilates the alveoli gently and may be of great value in the winter in early cases; insomnia is generally aggravated by high altitude and the chest wall must not be rigid. Spa treatment afforded another useful method of benefiting early cases. When bronchitis was firmly established the treatment must aim at diminishing secretion—warmth, absence of fog, and dry air, though some are helped by a moist climate when cough was hard and sputa scanty. The Western Riviera was drier than the Eastern; patients with scanty expectoration were probably better off at Rapallo than further East. Egypt is ideal for certain months for cases with profuse expectoration;

asthma cases should not be at sea-level; as small an elevation as 100 ft. might make all the difference as to frequency of paroxysms.

Mr. G. Seccombe Hett (London) said that all the cases of chronic bronchitis which he saw were descending infections from the upper respiratory tract. Children with bronchitis usually have a poor air way through the nose and infected tonsils and adenoids. Deflected septum induced nasal catarrh and nasal sepsis. Undue patency of the nose also induced nasal sepsis and a descending infection. Tonsillar infection in adults was less likely to produce bronchitis than nasal infection, but infected teeth should always be removed. Chronic bronchitis was very apt to follow asthma and hay fever because swelling and hypersecretion in the upper respiratory tracts sooner or later allows of infection. Removal of polypi, not in themselves the cause, might relieve bronchitis and asthma by promoting drainage of infected ethmoidal cells.

Dr. A. C. Inman (London) said that every case of chronic bronchitis should have the sputum examined for tubercle bacilli, and the possibility of a syphilitic infection must always be borne in mind. From a bacteriological point of view the most important organisms were streptococci and *B. friedländer*. In the treatment of the latter infection vaccine was very useful, in the former disappointing. Preventive inoculation should be carried out during periods free from catarrh.

Prof. E. L. Collis (Cardiff) wrote that chronic bronchitis contributed so much to sickness and death that it was facile princeps amongst disease, especially in later life. It was probably responsible annually for 80,000 years of invalidity and 28,000 deaths. The death-rate has been falling rapidly since 1870. The disease is induced by wintry weather and atmospheric pollution: a chronic traumatic origin was commoner than an infective. Reduction in morbidity and mortality may be expected to follow (*a*) such social uplift as increases the health of lower grades of society, and (*b*) smoke abatement in industrial districts and great towns.

Dr. F. G. Layton said the belief in magic was not yet dead; he had recently come across a boy suffering from pulmonary disease who had a sheep's lung tied to each foot.

Dr. Florence Stoney (Bournemouth) drew attention to dental sepsis as a cause of chronic bronchitis.

Dr. Aston Key (Portsmouth) said that one of the great troubles was that the bronchial mucosa was incapable of repair. It was true that many cases of bronchitis arise from obstruction to the nose, and such always succumbed to bronchitis whether the nose were operated upon or not.

Dr. G. B. Batten (Dulwich) gave his experience during 37 years of general practice. In the old days chronic winter bronchitis was very common and difficult to treat, the old ladies being overdressed and living in stuffy atmospheres. The introduction of the fresh air treatment of tuberculosis was a great help and these patients were weaned from stuffy rooms and overclothing to fresh air habits, and he now knew of no individual who had habitual winter bronchitis. The important thing is to make the patient live out of doors.

Dr. Hyla Greves (Bournemouth) said chronic bronchitis was usually a secondary infection rather than a primary one, and constitutional disorders such as gout, arterio-sclerosis, renal disease, and peribronchial tubercle were common underlying factors. In treatment climate plays an important part, and the south of England provided many suitable resorts. The resistance to cold should be gradually cultivated. In acute and subacute cases dry cupping of the bases of the lungs was a valuable agent.

Sir Thomas Horder stressed the importance of such underlying constitutional disorders as gout, hyperpiesis, myxœdema, and other endocrine disorders. All cases of bronchitis were not infective; in some infection plays but a minor part, and this explained the success of vaccine in one class and its failure in another. Cases of "mucous diathesis" whether involving the respiratory or alimentary tracts were very difficult to treat. Mucous bronchitis was intermediate between the paroxysmal type (asthma) and the true infective types. It was very important to treat the nervous cardiovascular and digestive systems in such patients.

Dr. Donald Hall (Brighton) said that he had found autogenous vaccine of value and had had a very mixed experience of operative treatment in the upper respiratory tracts.

Dr. Perkins, in reply, said that he was satisfied with the result of the discussion. The fact that chronic bronchitis was usually secondary had emerged and the importance of educating people to an open-air life was well recognised.

SECTION OF LARYNGOLOGY AND OTOLOGY.

THURSDAY, JULY 26TH.

This combined section met on two days under the presidency of Mr. E. B. Waggett. In opening a discussion on

Internal Ear Deafness

Dr. Dan McKenzie (London) began by deploring the disparity between our anatomical as opposed to our pathological knowledge of the labyrinth. He described the well-known difficulty of assessing the value of tuning-fork tests in deciding whether the case was of middle or inner ear deafness. With regard to obstructive deafness, nobody had thrown doubt upon the correctness of the inferences to be drawn; but he described a case in which all the classical science of nerve deafness were present in which removal of impacted cerumen was followed by immediate cure of the deafness. Mixed deafness was the commonest type of all, and the affection of the labyrinth in these cases might be merely a functional derangement. The commonest cause of nerve deafness was middle-ear disease; this was a fundamental point and based on statistics from his own practice. The prognosis of nerve deafness with middle-ear disease was grave unless the latter could be arrested. Myxœdematous deafness was a mixed type but happily yielded readily to thyroid medication if begun early. He next dwelt upon the relation between the vestibular reflexes and nerve deafness; they co-existed in acute labyrinthitis, though rarely in a chronic labyrinthitis. He had not seen vertigo in the sudden deafness that occurs in mumps. Vertigo might attend upon almost any type of disease, whereas tinnitus was usually tympanic. Having dealt with noise-deafness, senile deafness, syphilitic and toxic deafness, he concluded by sounding a note of hope provided that means could be found for encouraging pathological research of the type so well exemplified in J. S. Fraser's work.

Thirteen speakers took part in the discussion. Mr. W. M. Mollison (London) grouped deafness into qualitative and quantitative. In the qualitative types, obstructive or perceptive, there was a loss either of the upper or lower tones, whereas the remainder of the scale was unaffected. In quantitative ear trouble there was an alteration all along the line; some of the quantitative cases were familial, some toxic, and some due to depression or elevation of sensitivity. Unlike the opener, he had seen vertigo with the sudden deafness of mumps. He mentioned the relation between Paget's disease and nerve deafness, and gave notes and radiograms of a case. He dwelt upon the importance of the lowering of the upper tone limit in diagnosing between middle and internal ear deafness, and of the use of the monochord both by air and bone conduction. He described cases of astounding acuity of hearing in the blind and in certain types of neurasthenics, where whispers could be heard round several corners. Similarly, hypersensitivity of the canals was a clinical entity. Perhaps the canals were getting less valuable to man, and this hyperacuity in neurasthenics was a want of progress in the acquired art of excluding unwanted stimuli. Mr. A. J. M. Wright (Bristol) classified 71 cases from the point of view of ætiology;

ose with an obvious cause, such as trauma and philis, offered no difficulty. He had seen dramatic provement with salvarsan given early. Of the mainder two-thirds were females. In these doubtful ses septic foci accounted for a certain number; me were functional, and in these one could usually d a history of some suggestion early in the case. the remainder, childbirth, thyroid deficiency, and so-motor rhinitis accounted for the majority. He as satisfied that with regard to the deafness due to rve traumatism by noise, removal of the cause led an arrest of the progress of the lesion. Sir J. UNDAS-GRANT, with a facility which can result only om a vast experience, touched rapidly upon a wide nge of subjects, among them senile deafness (which, e other senile changes, was not a question of ronology), the explanation of the value of quinine unilateral labyrinthine vertigo, the value of tuning-rk tests, the question of the effect of pre-existing r disease in war cases, the use of perchloride of ercury in auditory nerve traumatism, deaf-mutism, d his instrument for the cold air caloric test. Mr. . J. LEIGHTON (Manchester) said syphilis was not to overlooked. He emphasised the psychological ctor both in ætiology and treatment of deafness, scribed a labyrinthine storm relieved by inflation, d mentioned the importance of caloric tests in stinguishing between central and labyrinthine lesion.

The PRESIDENT said the speeches had brought out e important point that in a large proportion of ternal ear deafness cases evidence of middle-ear sease was present. Many cases of so-called nerve afness were possibly due to disease in the foramen tundum. It was important, and perhaps significant, at all cases of hyperostosis of the meatus showed ns of deafness of the internal-ear type. He d not found during three years with an army soaked with quinine" any chronic deafness caused quinine or by malaria, and he had some doubt to the existence of deafness due purely to such uses.

A concise and workmanlike paper was read by Mr. D. D. DAVIS (London) upon

Retrobulbar Neuritis of Nasal Origin.

tabulated 54 carefully worked out cases, in four ly of which he had been able to prove the existence sinusitis. In these there was gross evidence of the uble, and he deprecated any attack upon the sinuses the absence of very definite signs of suppuration. e neuritis was wont to wax and wane with or without atment, which made it difficult to accept accounts cures. Sir STCLAIR THOMSON (London) agreed with . Davis, and condemned a tendency in some untries to operate upon sinuses without evidence of ease, simply because improvement had followed such ps on occasion. Progress in surgery must be on er foundations than this. Dr. RITCHIE RODGER ull) and Mr. SOMERVILLE HASTINGS (London), the other hand, had seen dramatic improve-nt after opening sinuses apparently healthy, d ascribed a larger proportion of cases to sinus uble.

The morning ended with an interesting paper by . H. D. GILLIES (London) on the

Surgical Treatment of Nasal Deformity

h special reference to the nose of tertiary syphilis. s lantern slides bore convincing testimony to the vance he has made in this field, by the introduction a two-stage operation. The first stage consists in intranasal incision of the scar which anchors the aining nose to the pyriform opening. This release bles the nose to be pulled down into a normal sition, the resulting large raw area on its deep face giving a measure of the loss of lining that has urred. The replacement of this loss by Thiersch ft is achieved by his modification of the Esser inlay, l permits the second stage—of cartilage grafting—lly to rid the patient of the "syphilitic" appear-e. In a depressed fracture the cartilage graft may inserted without the preliminary stage.

The afternoon was pleasantly spent in a visit to the Portsmouth Eye and Ear Hospital, where Mr. C. A. SCOTT RIDOUT showed a series of cases.

FRIDAY, JULY 27TH.

In opening a discussion on

Spasm of the Larynx,

Sir STCLAIR THOMSON, after a definition of terms, briefly reviewed the anatomy and physiology of the parts concerned and began by classifying the known causes of spasm. He emphasised throughout the importance of psychological factor in intensifying and even originating spasm, and mentioned that in his long experience he had not had occasion to perform tracheotomy, though he was far from condemning the procedure where the strain on the heart was obviously too great. He was convinced that whooping-cough in adults sometimes was the cause of spasm (an original observation this) and quoted cases due to gout, morphia-habit, and tabes. Like most of his hearers, he had found difficulty on occasion in distinguishing between abductor paresis and adductor spasm, but was able to indicate clinical methods of solving the difficulty. Having touched upon Semon's law and spasm in anæsthesia, laryngismus stridulus, hiccough, and epilepsy, he concluded by summing up the lines of treatment at our disposal. The problem, as ever, depends upon diagnosis, and in each case a most exhaustive examination was necessary to ensure that we were not treating a case of paresis by sedative methods.

Sir J. DUNDAS-GRANT drew a very definite distinction between laryngismus stridulus and laryngitis stridulosa, the latter condition being the same as croup and being found in rickety children. Perhaps the deficiency of calcium led to a relative hyper-excitability of the nervous system, and such irritations as adenoids supplied the necessary stimulus. He discussed the laryngeal crisis of tabes and their relief by local anæsthetisation of the larynx. He described laryngeal vertigo, and an explanation of it, and concluded by describing the relief of functional ephonia by faradising the lingual tonsil. Dr. W. J. KELSON (London) said that we must not neglect the fact that the ventricular bands form a false glottis which at times becomes spasmodically closed. He discussed the difficulty of distinguishing between spasm of the adductors and paresis of the abductors. He pointed out that the muscles which close the air-way happen to be stronger than those which open it, and, therefore, the tendency of any nerve irritation is to cause closure. The excitability of the reflex mechanism is greater in children, and especially in sleep, when the cortical centres are depressed. He quoted two cases of fatal spasm of the glottis in children in which a necropsy revealed the signs of rickets only. He described a case of hysterical and prolonged spasm in an adult woman accompanied by a high-pitched stridor both on inspiration and expiration, which was treated by galvanism. Dr. PETER MACDONALD had had unique opportunity of observing intimately a case of recurrent glottic spasm in a woman, and described the means regularly employed to bring an attack to an end. The PRESIDENT, unlike the opener, had had occasion to perform tracheotomy for glottic spasm upon a patient suffering from an aneurysm, and mentioned the danger of delaying intervention too long. Dr. WILLIAM HILL (London) described a dramatic case in which the patient had died as he made the incision for tracheotomy, and discussed the occasional need for artificial respiration after tracheotomy alone had been unsuccessful. Mr. A. J. WRIGHT and Mr. S. HASTINGS also described their experience of the condition.

Mr. LEIGHTON read an interesting paper on

Organotherapy in Ear, Nose, and Throat Work.

There were many conditions in which organotherapy formed a useful adjuvant to other treatment, but it was difficult to lay down rules. He might say, however, that the endocrine organs might act from excess or deficiency of secretion or from perverted secretion.

He mentioned McCarrison's work on the relation between sepsis in the tonsil and other organs and thyroid activity, and quoted cases bearing on it. The pituitary had become increasingly important, and headaches due to a derangement of the pituitary had to be diagnosed from sphenoidal disease. Diabetes, abnormal blood pressure, climacteric deafness, neuroses, hypothyroidism were all common causes of ear trouble and were alike amenable to organotherapy. Mr. **HASTINGS** inquired as to the dosage of thyroid extract advocated by the speaker.

Short Papers.

Mr. J. A. **GIBB** (Maidstone) read a short paper upon the Referred Pain of Nasal Sinus Disease. The position to which pain is referred was often disregarded. He would tell us of some cases in which a study of referred pain had been useful in his experience. Other viscera sometimes chose the same areas as did the nasal sinuses, and therefore, of course, one's observation should be backed by a thorough general overhaul. The position of the pain did not always depend on the severity of sinusitis, but might alter slightly if several sinuses were involved. He detailed the areas for the various sinuses and gave cases illustrative of his thesis. Mr. **WRIGHT**, Mr. E. M. **WOODMAN** (Birmingham), and Mr. T. B. **JOBSON** gave cases from their own experience.

In the afternoon Mr. V. E. **NEGUS** (London) read a paper upon a Newly-described Function of the Vocal Cords. The voices of animals did not necessarily depend on the size of their cords. During independent use of the fore-limbs for such actions as hanging from a branch or bringing them together against resistance the thoracic wall must be brought to rest to give a fixed origin to the muscles attaching the limbs to it. The pressure changes in the thorax are so great that sphincteric muscular action is inadequate to control them, and *valvular* action is brought into play in the larynx. He suggested that the cords closed and that the diaphragm descended a little, leading to a reduced pressure which played an important part in fixing the thorax. He used facts from comparative anatomy in support of his argument, but was inclined to infer too much from the observations made, and to underrate the many other causes which have operated in evolving the present structure of the larynx in man and other animals. His paper was discussed by the **PRESIDENT**, Sir **STCLAIR THOMSON**, Sir J. **DUNDAS-GRANT**, Mr. **JOBSON**, Mr. **WRIGHT**, and Mr. **RIDOUT**.

Sir J. **DUNDAS-GRANT** read a short paper upon Canfield's Operation upon the Maxillary Antrum, with cases. The method, described in 1908, consists essentially in a preturbinal approach to the sinus, the edge of the pyriform opening being removed subperiosteally until an inspection can be made of the interior. In the original operation, an elaborate flap of mucosa is prepared during the removal of the anterior third of the inferior turbinated bone, with which to line the antronasal communication, but the speaker agreed with Skillern and others in finding this unnecessary. The operation seems one to be reserved for those infrequent cases in which simple infra-turbinal drainage and lavage fail after some weeks to effect a cure. The **PRESIDENT**, Mr. **HASTINGS**, and Mr. **WRIGHT** voiced the general attitude of the audience with regard to leaving plugging in the nose, and it was left to Dr. W. **HILL**, ever the champion of the under-dog, to side with the reader of the paper as to its occasional necessity.

Dr. W. **HILL** read a paper upon Butyn as a Local Anæsthetic in nose and throat work. He had found it capable of replacing cocaine in some cases though not in all. It was two and a half times as expensive and was found to be less reliable in some 60 cases. Sir J. **DUNDAS-GRANT**, Dr. **SHEEHAN**, and the **PRESIDENT** also spoke.

After the last paper Dr. **EASTMAN SHEEHAN** (New York Post-Graduate Hospital) gave a novel demonstration of animated photographs of plastic operations for the relief of deformities of the nose.

DISEASES OF CHILDREN.

THURSDAY, JULY 26TH.

THIS section met on two days. At the first session the President, Dr. **EDMUND CAUTLEY** (London), being in the chair, a discussion on

Acidosis and Alkalosis in Children

was opened by Dr. P. J. **CAMMIDGE** (London), who said that the old idea of acidosis, in the sense that the symptoms associated with it were dependent upon the presence of unneutralised acid products of abnormal metabolism in the blood, had had to be replaced by a new conception. The normal faintly alkaline reaction of the blood was maintained constant by buffer substances which could deal with a large quantity of acids or alkalies without the reaction of the fluid being altered. The entrance of acid products into the circulation decomposed some of the bicarbonates and produced a relative excess of carbon dioxide which was then excreted by the lungs. Normally the bicarbonate was quickly replaced, but under pathological conditions the alkaline reserves might be depleted and the proportion of bicarbonate permanently diminished. Such symptoms as air-hunger would ensue, and finally death. Acidosis then, was a condition in which the concentration of bicarbonate in the blood was reduced below the normal level. Theoretically acidosis might arise by introduction from without of a large quantity of mineral acid, by abnormal formation of acids within the organism (diabetic coma), defective elimination of excretory products (interstitial nephritis), or by excessive drain of bases as in profuse diarrhœa. Alkalosis would occur with excessive intake of alkaline bases. A similar condition might arise should there be an abnormally small amount of acid formed in the metabolic cycle, but of this there was no convincing example. An increase in the alkaline reserve occurred during gastric digestion when acid was excreted into the stomach. Finally it could be brought about by excessive elimination of CO_2 as in voluntary forced breathing. The speaker illustrated his points by reference to cases of diabetes and cyclic vomiting in children.

Dr. **RUTH CONWAY VERNEY** (Edinburgh) read a paper on the reaction of the blood in children. By observing the hydrogen-ion concentration in relation to the tension of free and of combined CO_2 it was possible to get some idea of the factors controlling the acid-base balance. Among these factors the blood-buffering power was of great importance. She wished to emphasise the value of protein base salts as buffers. Of these hæmoglobin compounds were the chief. She explained the way in which this buffering action of hæmoglobin was brought about. The results which she had obtained by blood estimations in normal children and in those with anæmia confirmed this. She had also studied the blood of children with post-operative acidosis. She hoped to build up a method by which a prognosis could be given as to the likelihood of acidosis occurring in a child about to undergo operation.

The **PRESIDENT** said that there was still a certain confusion in his mind as to the differentiation and effects of acidosis and alkalosis. Could ketonuria occur without acidæmia? If it could exist with alkalæmia, as some speakers had observed, it implied that imperfectly desaturated fatty acids were circulating in a blood in which there was an excess of alkaline bases.

Dr. E. P. **POULTON** (London) had listened with admiration to Dr. Cammidge's exposition of a difficult subject, but he did not agree with him on certain points. Although three years ago the speaker had himself suggested the classification used by Dr. Cammidge he now preferred to do away with the terms acidosis and alkalosis, and substitute "acidæmia" and "alkalæmia" for an increased or diminished hydrogen-ion concentration in the blood. He protested against the theory first put forward by Pavy, and revived by Dr. Cammidge, that coma was due an inability of the blood to transport CO_2 from the ues. Dr. Poulton spoke of the association of alæmia with tetany and described that form of any which is brought about by forced breathing. ssibly it was not the alkalæmia itself but some ration in the balance of metallic ions which ught on the condition. He mentioned a case t had tetany from a gastro-colic fistula through ich valuable HCl was passed in the stools. Cure owed the closing of the fistula. J. S. Haldane shown that the ingestion of large doses of monium and calcium chloride caused an increase ixed acid in the blood. This explained the success these drugs in the treatment of tetany. In two es of acute rickets at Guy's, Osman and Bayers found a marked fall in the plasma bicarbonate. considered, however, that diminished plasma arbonate was an accompaniment and not the se of rickets.

r. **ERIC PRITCHARD** (London) agreed that the w that acidosis and ketosis were the same obscured real significance of acidosis. Health in children ended more on the extent of the alkaline reserve n on any other factor. The fæces were a very ortant source of elimination of metabolic pro- ts. Where the stools contained much fat, as in ets, bases were excreted in combination with y acids and the alkaline reserve was thus rapidly leted. The fatty acids in the fæces might be due unabsorbed fat, or they might be produced in the od, neutralised, and then excreted by the intestine. ective oxidation was one of the causes of the earance of fat in the fæces and of depletion of the aline reserve. It was usually due to overfeeding to absence of fresh air and sunlight.

r. **CATHERINE CHISHOLM** (Manchester) said that her experience acidosis occurred frequently in umonia, and the disease often responded quickly arge doses of alkalies.

r. **CAMMIDGE** briefly replied.

olonel R. J. **BLACKHAM**, R.A.M.C. (retd.), read a er on

Cows' Milk in Infant Feeding.

fortunately, he said, breast-feeding was not always sible and then cows' milk was the most practical stitute. The best form in which to give cow's k was, however, a matter on which there was siderable difference of opinion. Raw milk was ocated by some, but it was dangerous on account the bacteriological infection it could engender. casein of one animal was, to an appreciable ent, toxic to the offspring of another animal. t caused an albumin to lose its individual characstics and thereby diminished its toxic action. He orsed Prof. Marfan's saying: "Cows' milk is ter raw than cooked for calves and better cooked n raw for infants." He discussed the advantages med for condensed and dried milks. In his erience infants reared on the former were fat, , and often listless. Milk dried by the spray hod had the advantage that it formed a curd that of human milk. It was constant in comition, contained most of the vitamins, and was not le to contamination.

FRIDAY, JULY 27TH.

Summer Diarrhœa.

r. **DAVID NABARRO** (London) opened the discus- . He gave a review of the work done by bacterio- sts, and of his own observations in the cases which ad studied with Dr. D. H. Paterson in 1921. In ry epidemic the organisms found had been very able. Even when the same bacillus was isolated a group of cases, its characters were apt to nge, and many subgroups were identified. Some teria, such as Morgan's No. 1 bacillus, were ittedly present in a large percentage of the cases, they were also present in the fæces of normal dren. It was impossible to assign any one of n as the cause of the disease. In America entery bacilli had been isolated in a number of cases which clinically showed blood and mucus in the stools. Similar cases had also been recorded in England, but in this country they formed a very small minority. He had therefore come to the conclusion that summer diarrhœa was not an infective disease in the strict sense of the word. The primary cause was not bacteriological but nutritional. He agreed with the dictum of Pfaundler that the children sicken "ex alimentatione," and that they died "ex infectione." Exposure to heat or cold, bad air, over-clothing, and improper feeding paved the way for bacterial infection. At the same time there was probably an increased virulence of the organisms concerned. The incidence of summer diarrhœa had decreased considerably of late years, and he hoped that the disease might soon become a thing of the past. The work of welfare centres in teaching mothers how to clothe and feed their children, the reduction of flies in cities, and the use of dried milk were all contributing towards this end.

The **PRESIDENT** said that Dr. Nabarro had raised many interesting points. He himself thought that summer diarrhœa was infective. In his hospital, although the cases were nursed like typhoid, the disease sometimes spread in a ward from one child to another. The infection in these instances was probably carried by flies. Some of the most severe toxæmic cases he had seen had begun in well-nourished children. In them a predisposing state of nutrition did not appear to have had anything to do with it. He considered that the disease was infective, but that many different organisms were involved.

Dr. D. H. **PATERSON** (London) pointed out that true summer diarrhœa occurred in only a small proportion of children who had diarrhœa in summer. The Americans distinguished between fermentative and infective diarrhœa according as to whether the stools contained blood and mucus or not. In his series at Great Ormond-street, out of 149 only four had shown blood and mucus. Fifty per cent. had a history of dyspepsia, the other half were fat and over-fed. In such children a spell of hot weather might bring on an acute intestinal upset. If they were taken off food altogether, acidosis was likely to supervene. Most of the cases of diarrhœa were due to bad feeding and mismanagement. Only a small minority were the result of a specific organism. In proof of this he maintained that a diet in which fermentation was reduced to a minimum was the most successful in treatment.

Dr. **BERNARD MYERS** (London) followed Finkelstein's classification of nutritional disorders. Excess of sugar and fat was a common cause of intestinal fermentation. Treatment in these cases consisted in reducing the sugar and the fat in the food. Protein was well tolerated. Some cases were nutritional, some infective; the treatment of the two conditions was different.

Dr. **CHISHOLM** supported the infective theory. The decline of the disease was due to welfare work and to the care taken in cities to prevent the spread of infection.

Dr. E. P. **BAUMANN** (Johannesburg) said that we had hitherto made a mistake in considering that all cases were infective. Some had a nutritional basis. We must not, however, go to the other extreme. The mode of onset would differentiate between the two types. Finkelstein fed his cases on buttermilk or whey; he seldom starved, never for more than six hours. Buttermilk had the advantage of being a food rich in water and salts.

Dr. G. B. **SWEET** (New Zealand) said that he believed in Dr. Finkelstein's treatment, but protein milk was difficult to prescribe in general practice. He had obtained considerable success in treatment of cases with dried skim-milk. It was simple to use, free from germs, and contained very little fat. It was the fat in the food which was the chief source of trouble.

Dr. **PRITCHARD** laid stress on the reaction of the fæces as a guide to treatment. In fermentative diarrhœa the stools were acid, when there was proteolytic decomposition they were alkaline. Buttermilk was merely a coarse method of introducing the lactic acid bacillus. He preferred to give lactose with lactic acid bacilli when the stools were alkaline, and protein milk when there was acid fermentation. Indiscriminate treatment with protein or sugar solution was equally unsatisfactory. Instead of buttermilk he used a solution of pure casein. Saline was preferable to whey when salts were required. He agreed with the majority of speakers that cases might be nutritional or infective. Children who had been fed on carbohydrates suffered most in an epidemic.

Dr. NABARRO and Dr. PATERSON replied to the discussion.

Dr. HUGH ASHBY read a paper on the

After-Results of Abdominal Tuberculosis in Children.

He laid stress on the difficulty of arriving at a certain diagnosis. It was important to exclude cases of rickets or dyspepsia which might closely resemble tuberculosis. Resistance to tuberculosis in early life was at its minimum. Cases under 1 year were practically always fatal, but the prognosis improved with the age of the child. The disease was most common at the age of 3 years. The source of infection had been a matter of considerable dispute. It had been stated that in 50 per cent. the disease was bovine, but in his opinion the majority of cases were due to human infection. With regard to the after-results in a series of 250 cases which he had been able to follow up, 56 per cent. were cured, 8 per cent. were doubtful, and 36 per cent. had died. These statistics showed the seriousness of the disease in children. In the cases which had recovered the large majority had grown up and kept perfectly well, a few had a tendency to colic and to looseness of the bowels. In some a mass of calcified glands could be felt in the same situation as the former enlarged glands, but they caused no trouble.

Dr. E. A. COCKAYNE (London) commented on the absence of after-effects. He also had felt calcified nodules which produced no symptoms.

Dr. PRITCHARD did not agree that abdominal tuberculosis under 1 year of age was invariably fatal. During the last ten years he had treated a number of children who had been infected by tuberculous mothers. Early diagnosis was made by means of tuberculin injections. In his series there had only been one death. Treatment by tuberculin had been very successful.

Dr. SWEET had obtained very good results in his cases by tuberculin treatment.

Dr. E. S. MOLYNEUX (Leamington) read a paper on the treatment of tuberculous cervical adenitis by radium. The treatment was painless and safe provided the technique was carefully carried out, and he had obtained a cure in nearly every case. Recurrence was rare. Caseating masses of glands, suppuration, and the presence of old sinuses were no bar to treatment. No scar was left unless suppuration had already occurred.

EXHIBITION OF INSTRUMENTS, DRUGS, FOODS, AND APPLIANCES.

(*Concluded from p. 306.*)

FOOD PREPARATIONS.

Foodstuffs and food accessories were represented by a large number of separate exhibits. [4] Bantam Products Ltd. (Farnley, Leeds): showed a preparation consisting of the soluble portion only of the coffee beans, the woody fibre having been removed; by this means a cup of fresh coffee of any desired strength can be instantly prepared with hot water alone, a 1*s.* 6*d.* tin providing 36 ordinary cupsfull.—[10] Food Products Ltd. (11, Queen Victoria-street, London, E.C. 4): a series of bovo-lactin foods, devised and elaborated by the late Dr. E. C. Hort, consisting of calculated amounts of animal protein, hæmoglobin, milk solids, and carbohydrates. Bovo lactin essence contains, per cent., protein 30·4, fat 0·2 ash 18·8, moisture 23·3, carbohydrates and extractive 27·4.—[46] Bovril Ltd. (148, Old-street, London E.C. 1): meat extract containing fibrin and albumin in concentrated form, with a special invalid preparation more highly concentrated and devoid of seasoning Attention was directed to the giving of half a pint o bovril before administration of an anæsthetic for the avoidance of post-operative sickness.—[49] Cadbury Bros., Ltd. (Bournville, Birmingham): an exhibit o Bournville cocoa and Bournville chocolate conforming to the highest standards of purity and uniformity.—[27] Food Education Society (329, Vauxhall Bridge-road, London, S.W. 1): a selection of literature, non-dogmatic and philanthropic, to educate the public in matters of food, cookery, and health; leaflets on diet for brain workers, aids to fitness, the importance of fat, how to choose sugar and others.—[53] Wm. Gaymer and Son, Ltd. (Attleborough, Norfolk) various brands of Gaymer's cyder, including the quality known as "dry," prepared from Norfolk apples.—[75] Glaxo (J. Nathan and Co., Ltd., 56, Osnaburgh-street, London, N.W. 1): full-cream, three-quarter-cream, and half-cream standardised dry milks for infants and adults, the milk being dried by a process proved to be non-destructive of the accessory food factors; attention was called to the timely use of glaxo in hot weather as a prophylactic against epidemic gastro-enteritis.—[50] Mead, Johnson and Co. (40, Lexington-street, London, N.W. 1): dextrines and maltose combined with cows' milk and water to form a complete diet for infants. No feeding directions accompany the packages, the doctor being left free to regulate the diet according to individual need.—[59] Horlick's Malted Milk Co. (Slough): an easily digested and highly nutritious diet for invalids and convalescents and a complete food for infants, filling a special need in Red Cross work, for preparation requires no cooking, the powder being simply briskly stirred into hot or cold water. Tablets are also available.—[76] Oxo Limited (Thames House, London, E.C. 4): Oxo fluid beef, being a concentrated form of stimulating extractives; Hospital-Oxo for invalids, peptonised and unseasoned; Lemco pure unseasoned beef extract; and the well-known Fray Bentos food products.—[16] Prideaux's Pure Casein Co., Ltd. (16, Southwark-street, London): the Dorsella milk food for babies and nursing mothers, a full-cream dried milk powder, prepared under approved conditions in Dorset. One pound cartons are supplied in bulk to welfare centres at 1*s.* 6*d.* in winter, 1*s.* 3*d.* in summer; also "casumen" pure milk casein containing 93 per cent. protein, and whey and buttermilk powders.—[84] Stowers (58, Bancroft-road, London, E. 1): cordials prepared from Jamaican and Dominican cultivated limes and from pure lemon juice with addition of cane sugar only, attention being called to the presence of vitamin A and the value of such preparations as antiscorbutics.—[22] Thew, Hooker and Gilbey, Ltd. (Buckingham): various milk products, including Hooker's malted milk and Hooker's malted milk tablets.—[37] Trufood Ltd. (Lever House, Blackfriars, London, E.C. 4): full-cream dried milk, prepared at the Creameries, Wrenbury, Cheshire, and readily reconstituted in cold water; also Humanised Trufood, with part of the casein withdrawn and cream and lactose added; also Secway, a sweet whey in powder form.—[73] Virol Limited (148, Old-street, London, E.C. 1): a preparation rich in marrow and beef fats, containing malt extract, eggs, and lemon syrup, for use in cases of wasting, rickets, and malnutrition; virolised milk is held to promote sound and natural sleep. Also virolax, containing 60 per cent. liquid paraffin in finely divided form acceptable to children and adults.—[39] Vitmar, Ltd. (Callard's Vitamin Foods, 74, Regent-street, London, W. 1): a food adjunct of high caloric value and containing vitamins A, B, and C, recommended for infants and growing children as well as a galactogogue for nursing mothers.

MEDICINAL AND MINERAL WATERS.

[15] The Apollinaris Co., Ltd. (4, Stratford-place, ondon, W. 1): Apollinaris, the pure natural sparkling ineral water bottled with it own CO_2 gas; Apenta, natural aperient water for cases of habitual contipation and biliousness; Vittel, a diuretic mineral ater for the arthritic and gouty.—[80] Bath (Mr. ohn Hatton, Director of Baths): an exhibit sent by he corporation, consisting of photographs of the athing establishments and the chief features of nterest at this inland spa.—[71] Buxton (Mr. H. L. B. itt, General Manager): an exhibit of official handooks and of the waters for sale in bottle form from his mountain spa, 1000 feet above sea-level.—79] Droitwich (Mr. J. H. Hollyer, Director of Bathing stablishments): setting out the characteristics of e climate in summer and winter of England's brine-aths spa, the character of the waters, and of the ttractions offered.—[72] Harrogate (Mr. F. J. C. roome, General Manager): unique in its diversity of prings, with 87 waters of various characteristics ollected under chemical and physical control.—0] Ingram and Royle, Ltd. (45, Belvedere-road, ondon, S.E. 1): samples of imported natural mineral aters, salts, and pastilles, including Vichy-Célestins, ontrexéville-Pavillon, Evian-Cachat, Hunyadi-János, nd 20 others.

MICROSCOPES AND SCIENTIFIC APPARATUS.

[1] J. W. Atha and Co. (8, Southampton-row, ondon, W.C. 1): showed Zeiss microscopes, with cessories including the photographic ocular "Phoku" ith continuous vision, and an apochromatic objective X" for dark-ground work. [7] C. Baker (244, igh Holborn, London, W.C. 1): various types of icroscope from the R.M.S. designed for the highest search work and photomicrography down to the dvanced Student's Microscope; also Greenough's nocular and universal models.—[8] Chas. Hearson d Co., Ltd. (14, Princes-street, London, W. 1): large selection of bacteriological, pathological, ysiological, botanical, and chemical apparatus, cluding Dreyer's new fat-extraction bath for bercle antigens.—[35] Kodak, Limited (Kingsway, ondon, W.C. 2): some interesting results of the astman panchromatic film which differentiates tween yellows and reds and admits of any degree of ntrast when used in conjunction with a Wratten ter; also developing tank outfits and dark-room cessories for X ray work.—[61] Rayner and Keeler, td. (Kemp Town, Brighton): a variety of lenses and hthalmological instruments including the Edridge-reen lamp and card tests, and various new types of ns, such as the lenticular deep concave.—[30] Short d Mason, Ltd. (Aneroid Works, Walthamstow, ondon, E. 17): the Tycos sphygmomanometer, curate and portable, a practical instrument for termination of the diastolic, systolic, and pulse essures.—[25] The Tintometer, Limited (the Colour boratories, Salisbury): Lovibond's colour scale d tintometer for the measurement and registration the colours of gases, liquids, and solids; also Dr. rbet's radiometer for the accurate measurement of lour changes in Sabouraud pastilles.

SUNDRIES.

[57] The Cellular Clothing Co., Ltd. (72, Fore-street, ondon, E.C.): showed Aertex cellular clothing for alth and comfort, and a selection of red garments tting off actinic rays for use in the tropics.—0] Hoskins and Sewell, Ltd. (Bordesley, Birming-m): special beds and bedstead equipment for spitals, sanatoria, and open air treatment, including e patent wheeling spinal stand, the "silent night" spital mattress, and the Alton sunshade.—[51] nuk, Ltd. (Portslade, Sussex): materials and pliances employed in the preparation, initial lishing, and maintenance of flooring and other terior woodwork.

MEDICAL AGENCIES.

[32] Mr. W. S. Atkins (43, Bedford-street, London, .C. 2): agent for medical tranfers and for permanent non-cancellable sickness and accident policies specially devised for the medical profession.—[64] The Medical Insurance Agency (429, Strand, London, W.C. 2): founded in 1907 to advise medical practitioners as to contracts most suitable to their needs and to obtain for them policies on the most advantageous terms consistent with secure protection.—[21] The Medical Sickness, Annuity and Life Assurance Society, Limited (300, High Holborn, London, W.C.): founded in 1884, as a mutual society confined to members of the medical and dental professions, for insurance against sickness and accident on a permanent contract basis.

BOOKS AND OFFICE ACCESSORIES.

[18] W. H. Barrell, Ltd. (112, High-street, Portsmouth): showed a comprehensive exhibit of portophones, typewriters, loose-leaf ledgers, dictographs, and the kardex visible record system, specially recommended for clinical reference.—[77] H. R. Ellis (9, Lovell's-court, London, E.C. 4): medical, surgical, veterinary, and dental books, very complete on the side of psychology and allied subjects.—[31] The Hammond Typewriter Company, Ltd. (75, Queen Victoria-street, London, E.C. 4): the multiplex machine, capable of writing in every language or style of type and in which the turning of a knob suffices for emphasis or special announcement with italic or other type. The machine is fitted with special medical and chemical characters and miniature type for writing out small labels.—[26] H. K. Lewis and Co., Ltd. (136, Gower-street, London, W.C. 1): a classified exhibit of new books in many departments, including those of the Cambridge University Press, and a selection of medical stationery, case-books, loose-leaf ledgers, card-index systems, and rubber-stamp diagrams.—[5] Minty (36, Southampton-street, London, W.C. 2): the Oxford Varsity sectional book-cases without metal fittings or projections and both dust- and damp-proof.—[54] Oxford Medical Publications (1, Bedford-street, London, W.C. 2): a complete set of text-books and works in medical, surgical, and general science.—[24] Stanley Phillips (45, Brondesbury-road, London, N.W. 6): an eclectic selection of recent publications in every branch of medicine, surgery, and allied sciences, including year-books of general medicine, surgery, and special subjects, and Meyer's Medical Dictionary in eight languages.—[62] L. L. Waters and Co. (55, Commercial-road, Portsmouth): office furniture of British manufacture made by Messrs. Frank Corke and Co., Southsea, also the Doctor's National Insurance Panel Card Index Cabinet.—[74] John Wright and Sons, Ltd. (Bristol): an excellent selection of recent publications, including indexes of differential diagnosis, prognosis, and treatment; the Medical Annual, a year-book of treatment and practitioner's index; and the medical practitioner's card-index system for account keeping.

The Services.

ROYAL ARMY MEDICAL CORPS.

Maj. D. L. Harding to be Lt.-Col., vice Lt.-Col. C. W. Mainprise (promoted).

The undermentioned Majs. retire, receiving a gratuity: C. Clarke (granted the rank of Lt.-Col.), G. Petit, and C. Ryles.

Temp. Capt. J. J. Walsh relinquishes his commn. and retains the rank of Capt.

The undermentioned Lts. are confirmed in their rank: F. C. H. Sergeant, W. L. S. Cox, and H. A. Gilkes.

TERRITORIAL ARMY.

The undermentioned relinquish their commns. and retain their rank, except where otherwise stated: Majs. E. C. M. Foster and J. Ewing; Capts. A. R. Bearn and H. Buck (granted the rank of Maj.), J. B. Macalpine, G. Stuart, and S. R. Wilson.

Capt. R. G. Michelmore (late R.A.M.C.) to be Capt.

ROYAL AIR FORCE.

G. Clark is granted a short service commission as a Flying Officer.

Correspondence.

"Audi alteram partem."

X RAYS IN EXOPHTHALMIC GOITRE.

To the Editor of THE LANCET.

SIR,—The leading article in to-day's issue of THE LANCET (p. 287), in commenting upon the two very excellent papers of Prof. G. R. Murray and Mr. A. J. Walton on the treatment of exophthalmic goitre, draws attention to the differences of opinion expressed therein as to the value of X ray applications. Mr. Walton has found their use "very unsatisfactory," and were the experience he records to be accepted as an average one I think all would agree with him. Surely, however, there must have been some flaw in the technique in the cases he has met with, where the effect of the rays appears to have been limited to scarring and burning of the skin, and in one case to actually producing a squamous carcinoma, without any changes in the gland or the periglandular tissues sufficient to be appreciated at a subsequent operation. My purpose in writing is not to advocate the X ray treatment of exophthalmic goitre, but that X rays, as applied by Dr. A. E. Barclay and Dr. J. M. W. Morison of this city, by the method described in Prof. Murray's paper, can be made to produce a very definite effect upon the gland without detrimental effect upon the skin I have no doubt whatever. The results in 100 cases[1] are to me, at any rate, fairly convincing, and in the same paper reference is made to a case of Mr. H. Stratford, shown at the West London Medico-Chirurgical Society,[2] in which radiation of the scar and the supraclavicular region for a year after removal of the breast for carcinoma induced such extensive atrophy in a previously healthy thyroid gland that the patient developed myxœdema.

My experience differs from that of Mr. Walton, who has "never found that it—i.e. X rays—makes a future operation more difficult on account of the fibrosis." I have operated upon several cases for Prof. Murray where X ray treatment had been previously applied, and have generally found that periglandular fibrosis is present, sometimes in so marked a degree as to render the freeing of the gland a much more difficult and lengthy procedure than usual. The fibrosis seems, moreover, to extend to the walls of the small arteries, so that the mouths of small vessels which would otherwise have closed automatically when torn across in separating the gland are unable to do so and bleed persistently, necessitating the application of many more ligatures than usual. By prolonging the operation and increasing the amount of handling of the gland and wound I believe that the prolonged use of X rays does increase the severity of a subsequent operation. Unless, therefore, X rays produce material benefit fairly quickly, their application should not be persisted with.—I am, Sir, yours faithfully,

Manchester, August 11th, 1923. ARTHUR H. BURGESS.

A NATIONAL PATHOLOGICAL MUSEUM.

To the Editor of THE LANCET.

SIR,—The cancer problem is now being tackled seriously by the medical profession, and appeal is being made to the general public for funds. May I earnestly urge that the histological side should be more widely and extensively studied? The histological structure of tumours varies so much that it is a matter of the greatest difficulty to follow them and keep them in mind. The great majority of specimens of malignant growths can be recognised quite easily, but there are an appreciable number which the pathologist finds the utmost difficulty in "spotting." Very early malignant growths and malignant changes occurring in a primary innocent tumour cause the greatest difficulty. In my own practice I meet with quite a large number of these cases, so what must be the tota number throughout the country ? These specimen would form valuable material for the investigation o cancer in its earliest stages and for the training o pathologists. I wish therefore again[1] to urge "th establishment of a national pathological museum, t contain examples of every disease of which example can be obtained, especially microscopic sections of th different tissues." These specimens should be full described and accompanied by clinical histories, s that pathologists might turn to them for guidance At present a pathologist is often unable to give precis information as to what course a case showing a unusual type of tumour is likely to take ; sometime he can get this information from a brother pathologist generally not. At present pathologists often hol different views as to the nature of certain tumours an their probable course, whether malignant or innocent Definite information on these points would b obtainable in the records attached to the specimens i a national museum.

If the appeal for funds results in a satisfactory response, I hope the committee already formed wil consider the allocation of a sufficient sum to, say, the Royal College of Surgeons, to inaugurate such a museum.—I am, Sir, yours faithfully,

ERNEST H. SHAW, M.R.C.P.

Camden-road, N., August 13th, 1923.

SAILORS AND VENEREAL DISEASES.

To the Editor of THE LANCET.

SIR,—With reference to the annotation on the above subject in your last issue, the National Council for Combating Venereal Diseases wishes to express its very grateful thanks to Sir John Collie for all the trouble he took in getting this Bill, drafted and promoted by it, through the House of Commons. The same Bill in the last Parliament became an agreed measure and only failed of becoming law owing to the sudden dissolution. Sir John Collie was kind enough to undertake to father it at its re-introduction in the present Parliament, and as an agreed measure it passed the House of Commons. The thanks of the Council are also due to Lord Muir Mackenzie who, at the request of Sir John Collie, undertook to shepherd it through the House of Lords. The National Council has been working to obtain this legislation since 1919.

I am, Sir, yours faithfully,

102, Dean-street, W., August 13th, 1923. E. O. GRANT, Secretary.

VILLAGE SETTLEMENTS FOR EX-SERVICE MEN.

To the Editor of THE LANCET.

SIR,—It is to be hoped that Lord Haig's appeal will not pass unheeded. It is because the majority of English men and women do not understand the position of the ex-Service man and are unable to grasp the truth that this apparent apathy exists. May I take the example of the ex-soldier consumptive, whether he be officer or private ? What can be more awful than his present position—unemployed and unemployable in the ordinary workaday world ? Yet in a village settlement such as Papworth he may not only find health but suitable employment at full wage or salary for the remainder of his days. At the moment the ex-officer has no opportunity of benefiting from such a scheme, being debarred by the regulations of the Ministry of Pensions. Health, employment, hope—all these he could obtain under the village settlement scheme. These men—both officers and men—desire the opportunity to work, to lead a life of usefulness without detriment to their health, but so far this country has given them very little help or encouragement. Capital only is required ; the men cease to be a burden to the State once they are settled in the village settlement.

I am, Sir, yours faithfully,

Cambridge, August 7th, 1923. P. C. VARRIER-JONES.

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[1] G. R. Murray, Brit. Med. Jour., 1922, i., 907.

[2] THE LANCET, 1921, ii., 1059.

[1] THE LANCET, 1923, i., 218

UNIVERSITY ELECTIONS IN THE NEW DAIL (IRISH FREE STATE).

To the Editor of The Lancet.

Sir,—A meeting of graduates of the National University, Ireland, adopted as candidates for the representation of the University in the new Dail Mr. Michael Hayes, M.A., Mr. John MacNeill, D.Litt., and Mr. William Magennis, M.A. A committee to secure the election of these candidates was appointed, and in the course of an appeal on behalf of the candidates has stated: Under present conditions stability of government and public security are the supreme necessity. Neither education, public health, nor any other vital service of the nation can be promoted unless stable government and respect for law are assured. Much constructive work awaits the coming Dail. Educational reform, long overdue, must be no longer delayed; no departments more urgently demand improvement than university and secondary education. Hand in hand with educational reform must come a real effort to provide efficient health services for the nation. The committee concludes by stating it confidently expects the vote and support of the electors for the three candidates selected, who share the views expressed in the appeal on their behalf by the Committee of Graduates.

The three candidates selected were the representatives of the National University in the last Dail. Although none of the candidates selected is a member of the medical profession, nevertheless it must be said all of them showed a very keen interest in medical matters in the last Dail, and were always ready to assist the medical profession whenever there was an occasion to approach the Minister of Local Government, who had charge of medical affairs. In the latter respect Mr. Hayes was frequently the means of bringing the profession in the Free State in contact with the Minister of Local Government. It was Mr. Hayes who arranged for and introduced to the Minister of Local Government the deputation from the Irish Medical Committee who waited recently in connexion with the proposed scheme of medical legislation for the Irish Free State. Mr. Magennis also did very excellent work in the last Dail for the profession. He made, on different occasions, eloquent and powerful speeches urging the better treatment of Poor-law medical officers both as regards salaries and pensions, and put himself on every occasion at the disposal of the profession when it was a case of redressing their legitimate grievances. It is hoped that medical graduates of the National University resident in Great Britain and Ireland will not fail to record promptly their votes for the candidates whom they have reason to believe will best serve medical interests and the interests of public health generally in the new Dail.

At the time of writing Dublin University has not selected its representatives for the Dail. It is, however, almost certain that Sir James Craig, M.D., will be a candidate if there is to be a contest, and it is hoped the electors of the Dublin University will record for him their first votes. Sir James Craig was a most successful and popular member of the last Dail; he did excellent work in enlightening members of that body with regard to all matters of a medical nature, and whenever, in this respect, he made representations to the Government he generally succeeded in getting most of what he wanted.

I am, Sir, yours faithfully,
T. Hennessy, F.R.C.S.I.,
Irish Medical Secretary, B.M.A.

South Frederick-street, Dublin, August 13th, 1923.

PS.—University electors should lose no time in returning their ballot papers when signed and with them the identification certificate; either without the other is useless. The poll will be open for one day only—Monday, August 27th—and as the postal service is still somewhat disorganised, the proper course is to have the necessary papers signed and returned without an hour's delay.

THE IMPERIAL CANCER RESEARCH CAMPAIGN AND THE CANCER PROBLEM.

To the Editor of The Lancet.

Sir,—Major Leonard Molloy's letter in your issue of August 11th requires correction in one or two essentials. The British Empire Cancer Campaign is distinct from the Imperial Cancer Research Fund; the latter has been in existence for 20 years. The British Empire Cancer Campaign is not yet in existence as an organisation engaged in cancer research. Dr. Molloy says that the Treasury grant to the Imperial Cancer Research Fund is "utterly inadequate." This is an erroneous statement of the case, because the Imperial Cancer Research Fund is not now and never has been in receipt of Government financial support, although several Government departments are represented on its general committees and subcommittees. Permit me to add that I disagree with the implication in Dr. Molloy's letter that the only requirement for success in cancer research is money. It is a libel on men of science in this country to suggest that the trained intellects capable of solving the pathological and therapeutic problems of cancer are here and only waiting for the money to tempt them to engage in these problems.—I am, Sir, yours faithfully,

J. A. Murray.

Imperial Cancer Research Fund, 8–11, Queen-square, W.C. 1, August 13th, 1923.

Medical News.

Royal Colleges of Physicians of London and Surgeons of England.—At the Final Examination of the Conjoint Board held during the month of July the following candidates were approved in the subjects indicated, but are not eligible for diplomas:—

Medicine.—B. Abelman, Liverpool; R. S. Anderson, St. Bart.'s; R. G. Anthony, Birmingham; A. J. Boase, St. Thomas's; E. G. Bradbeer, Bristol; A. Broido, Guy's; J. W. Brown, Middlesex; S. G. Brown, London; Mary Buck, Royal Free; F. B. Byrom, London; H. K. Christie, Otago; W. Clark, Charing Cross; R. F. Connell, Middlesex; R. Cove-Smith, Cambridge and King's Coll.; A. B. Cowley, St. Bart.'s; I. S. Cristol, Leeds; G. J. W. Crosby, Cambridge and Univ. Coll.; S. S. Cruden, St. Bart.'s; D. E. Cuffey, Cambridge and King's Coll.; Agnes S. Daniel, St. Mary's; A. B. Davies, Guy's; D. T. Davies, Cardiff; Margaret B. M. Dewhurst, St. Mary's; V. W. Dix, Cambridge and London; I. A. Dubinsky, Halle; H. R. Dutton, Bristol; Winifred P. Edmunds, King's Coll.; Barbara J. Edwards, Birmingham; L. C. Edwards, Cardiff and London; A. C. M. Elman, Univ. Coll.; R. B. Fawkes, Cambridge and Guy's; E. K. A. Firth, Edinburgh and St. Thomas's; H. B. Flooks, Guy's; Theodora M. Fowler, St. Mary's; H. G. Goldwater, Middlesex; H. Graf, Liverpool; F. H. K. Green, St. Bart.'s; R. D. Gross, Guy's; S. A. Gunter, St. Bart.'s; I. E. Harries and J. C. Hewetson, Guy's; G. Hochschild, St. Thomas's; Frances A. Hogben, Manchester; E. G. Holmes, Cambridge and St. Bart.'s; Dorothy M. Howse, Univ. Coll.; Gwynedd Hugh-Jones, Royal Free; L. I. Hyder, King's Coll; E. C. James, Cardiff; S. W. M. King, St. Bart.'s; P. E. M. Lanier, Middlesex; J. J. Lewenstein, Guy's; L. A. N. Line, Birmingham; R. H. Little and R. G. B. Marsh, St. Thomas's; D. G. Martin, St. Bart.'s; Lucy M. T. Masterman, St. Mary's; G. B. Matthews, Charing Cross; T. F. Meyrick and H. D. N. Miller, King's Coll.; G. O. Mitchell, Guy's; G. F. L. Mitcheson, Oxford and St. Thomas's; P. M. Moffatt, Guy's; C. I. N. Morgan and N. Moulson, St. Bart.'s; G. Murray-Shirreff, Bristol; M. Myers, Durham and Guy's; Grace H. Newell, Royal Free; F. N. Newell-Roberts, Guy's; C. E. Newman, Cambridge and King's Coll.; Doris M. Odlum, St. Mary's; F. W. Oldershaw, London; Helen E. D. E. Ornstein, King's Coll.; C. H. Owen, Liverpool; T. G. W. Parry, Guy's; P. R. Peacock, Middlesex; T. W. Preston, H. A. Robertson, and O. F. W. Robinson, King's Coll.; Sybil H. G. Robinson, London; A. B. Rufail, King's Coll.; G. Sanders, Liverpool; A. S. Simpson, King's Coll.; K. H. Southall, Univ. Coll.; T. R. Sutherland, Cambridge and St. Bart.'s; Margaret Swete and Annie Sydenham, Royal Free; W. E. C. Thomas, Cardiff; R. W. H. Tincker, St. Bart.'s; F. C. O. Valentine, Cambridge and London; Kathleen C. Vost, St. Mary's; G. M. Wadsworth, Leeds; H. F. Walker, Middlesex; and Esther Wingate and Isabelle J. Woodhouse, Royal Free.

Surgery.—R. D. Alexander, St. Thomas's; R. H. Amm, Guy's; N. F. Azer, Charing Cross; A. E. Beith, St. Bart.'s; E. M. Bergheim and M. Bersinski, Middlesex; D. R. Blunn, London; C. O. S. B. Brooke, St. Bart.'s; R. W. Brookfield, Liverpool; Lily C. Butler, Royal Free; F. B. Byrom, London; Phyllis M. S. Chalmers, Royal Free; P. S. Connan, King's Coll.; I. S. Cristol, Leeds; E. R.

Cullinan and C. H. C. Dalton, St. Bart.'s ; A. F. D. Darlington, St. Thomas's ; I. G. Davies and T. D. Deighton, St. Bart.'s ; J. E. Elam, Cambridge and St. Bart.'s ; J. A. Evans, Sheffield ; S. Farquharson, St. Thomas's ; W. H. George, London ; H. M. Golding Bristol ; T. S. Goodwin, P. D. Griffiths, and C. J. P. Grosvenor, Cambridge and St. Bart.'s ; C. C. Halliwell, Cambridge and St. Thomas's ; H. E. Harris and A. W. Hart-Perry, St. Bart.'s ; G. T. Henderson, Cambridge and Guy's ; K. W. Heritage, London ; Florence R. Hodges, St. Mary's ; J. Holmes and J. P. W. Jamie, St. Bart.'s ; J. W. W. Jepps, St. George's ; J. H. Kok, Middlesex ; R. Lang, London ; D. E. Lawrence, St. Bart.'s ; R. S. McLatchy, London ; C. I. N. Morgan, St. Bart.'s ; E. G. Morris, St. Thomas's ; O. G. Morris, Guy's ; L. N. Moss, St. Mary's ; F. W. G. Nash, Middlesex ; M. Nazmi, Univ. Coll. ; E. E. Neser, Guy's ; C. P. O'Brien, St. Bart.'s ; P. H. O'Donovan and R. J. Oliver, London ; R. Owen-Jones, Middlesex ; Amy M. Parkinson, Charing Cross ; C. V. Powell, Bristol ; R. J. V. Pulvertaft, Cambridge and St. Thomas's ; V. J. Rao, London ; R. L. Rhodes, St. Bart.'s ; W. M. Roberts, Manchester ; Nina L. D. Robertson, King's Coll. ; M. Rochfelt, Univ. Coll. ; E. J. H. Roth, St. Bart.'s ; C. J. L. Sharp, London ; H. M. Shelley, Sheffield ; F. A. H. Simmonds, St. Bart.'s ; Edith E. Stephens, Royal Free ; J. D. M. Stewart, Cambridge and St. Bart.'s ; Viva E. K. Stuart, St. Mary's ; A. K. Tateson, Otago, St. Andrew's and Edinburgh ; H. C. van Dort, Middlesex ; D. Vaughan, Guy's ; G. M. Wadsworth, Leeds ; E. R. Weaver-Adams, St. Thomas's ; H. B. White, St. Bart.'s ; R. W. White, London ; S. C. H. Worseldine, Guy's ; and H. Yates, Cambridge and St. Thomas's.

Midwifery.—A. Ahmed, Birmingham ; R. D. Alexander, St. Thomas's ; F. G. A. Armson, Birmingham ; N. F. Azer, Cairo and Charing Cross ; Georgette Bachrach and Rose Baranov, Univ. Coll. ; T. F. Barlow, London ; O. Bastable, Leeds ; E. R. Bennion, Westminster ; E. M. Bergheim, Middlesex ; E. J. Blackaby, St. Bart.'s ; L. G. Blair and D. R. Blunn, London ; W. R. Bowen, Middlesex ; E. G. Bradbeer, Bristol ; W. H. Bradfield, Guy's ; E. T. Brice, Middlesex ; W. Brockbank, Cambridge and Manchester ; R. W. Brookfield, Liverpool ; Doris D. Brown, St. Mary's ; W. G. S. Brown, Cambridge and St. Bart.'s ; E. Buchler and G. H. Buncombe, St. Bart.'s ; I. Caley, King's Coll. ; W. H. Cameron, Middlesex ; L. W. Cann and R. J. Cann, Guy's ; R. E. D. Cargill, St. Bart.'s ; J. A. Carman, London ; C. M. Carruthers, Queen's Univ. ; J. H. H. Chataway, St. Bart.'s ; Nora Cheney, King's Coll. ; H. F. Chillingworth, St. Bart.'s ; H. K. Christie, Otago ; Gladys M. Clarke, St. Mary's ; H. G. Close, Guy's ; A. M. Cooke, St. Thomas's ; Rosemary Cooke, Cambridge and Charing Cross ; C. R. Cooke-Taylor, Univ. Coll. ; A. N. Coomaraswamy, Madras and London ; A. B. Cooper, St. Bart.'s ; Margaret Corner, London ; W. H. M. Cowper, Middlesex ; D. A. L. Crawshaw, Guy's ; B. W. Cross, St. Bart.'s ; G. P. Crowden, Univ. Coll. ; D. E. Cuffey, King's Coll. ; E. R. Cullinan, St. Bart.'s ; J. Cumming, Manchester ; A. F. D. Darlington, Cambridge and St. Thomas's ; Edith M. Davies, Cardiff ; Gwladys D. Davies, King's Coll. ; J. H. T. Davies and J. R. A. Davies, Cambridge and St. Bart.'s ; P. O. Davies and T. Davies, St. Bart.'s ; Dorothy L. C. Day, London ; J. R. B. Dearden, Cambridge and St. Bart.'s ; P. H. Diemer, St. Bart.'s ; I. A. Dubinsky, Halle ; W. H. du Plessis, St. Thomas's ; Hilda R. Dutton, Bristol ; A. C. M. Elman, Univ. Coll. ; Mary H. Elmitt and Brenda H. English, Royal Free ; H. G. Estcourt, Middlesex ; D. M. B. Evans, Charing Cross ; J. P. Evans, St. Mary's ; T. J. Evans, Middlesex ; R. B. Fawkes, Cambridge and Guy's ; M. J. Finklestone, Sheffield ; Theodora M. Fowler, J. H. Francis, and H. C. Gage, St. Mary's ; J. F. Goodenough, Guy's ; T. S. Goodwin, Cambridge and St. Bart.'s ; W. Gough, Birmingham ; F. M. Graham, King's Coll. ; D. L. Greig, Middlesex ; J. L. Griffin, Bristol ; G. J. Griffiths, Middlesex ; R. D. Gross, Guy's ; J. E. S. Hamilton, Bristol ; J. G. Hamilton, London ; Greta Hartley, Royal Free ; L. B. Haye, Univ. Coll. ; H. N. Hearle, Guy's ; Margaret R. Herford, Royal Free and St. Mary's ; K. W. Heritage, London ; A. G. Heron, Bristol ; J. C. Hewetson, E. F. Hewlitt, and G. C. Hughes, Guy's ; W. S. Hunt, Cambridge and Guy's ; I. M. Hurwitz, Guy's ; D. F. Hutchinson, St. Thomas's ; Ethel J. Isaacs, Westminster ; S. P. Jacobson, Guy's ; Bessie G. Jemson, London ; A. H. Johns, Cambridge and St. Bart.'s ; D. Jones, London ; D. S. M. Jones, Middlesex ; E. Jones , Guy's ; Enid M. Jones, Cardiff ; H. M. R. Jones, Middlesex ; Doris E. Joscelyne, Bristol ; C. J. Jewett, Manchester ; A. K. Kerr, St. Bart.'s ; E. F. King, Bristol ; M. C. H. Kingdon, St. Mary's ; R. Lang, London ; F. Langford, Bristol ; J. C. C. Langford and J. H. R. Laptain, St. Bart.'s ; W. C. Latham, Liverpool ; Mary K. Lawlor, King's Coll. ; J. J. Laws, Guy's ; Dorothy N. L. Leverkus, Royal Free ; J. J. Lewenstein, Guy's ; Nancy R. Lewis, St. Mary's ; L. A. N. Line, Birmingham ; W. H. G. M. Ling, St. Mary's ; W. J. E. Lupton, St. George's ; Kathleen M. Lyons, Univ. Coll. ; E. M. McCausland, Middlesex ; A. F. McGlashan, St. George's ; Lily C. MacKinnon, Charing Cross ; R. B. McVicker, St. Thomas's ; F. Marsh, Guy's ; G. R. Marshallsay, St. Mary's ; F. Martin, Guy's ; Margaret D. Mason, London ; Gwendolen S. Mence, St. Mary's ; G. A. Metcalfe, Cambridge and St. Thomas's ; M. Meyers, St. Bart.'s ; K. F. T. Mills, Cambridge and Middlesex ; S. M. Milner, Cambridge and Manchester ; G. F. L. Mitcheson, St. Thomas's ; W. E. Moody, St. Mary's ; E. G. Morris, St. Thomas's ; N. Moulson, St. Bart.'s ; R. T. Mummery, St. Mary's ; C. A. Nadicarianda, Bombay and London ; Grace H. Newell, Royal Free ; C. P. O'Brien, St. Bart.'s ; J. E. Outhwaite, Leeds ; D. U. Owen, Liverpool ; L. E. Owen and R. D. Owen, Guy's ; J. Parrish, St. Bart.'s ; K. O. Parsons, Guy's ; H. R. Paterson, St. Thomas's ; J. F. Payan, Guy's ; P. R. Peacock, Middlesex ; D. B Phillips, St. Thomas's ; T. M. Preece, St. Bart.'s ; T. W Preston and Nora Proctor-Sims, King's Coll. ; R. J. V Pulvertaft, Cambridge and St. Thomas's ; F. K. B Quanbrough, Bombay and St. Bart.'s ; E. H. Rampling St. Thomas's ; W. A. Rankin, Westminster ; Thirza Redman Liverpool ; S. F. Reynolds, Charing Cross ; Grace D. Rice St. Mary's ; W. A. Robb, St. Bart.'s ; H. A. Robertson an Nina L. D. Robertson, King's Coll. ; Sybil H. G. Robinson London ; W. C. Robinson, King's Coll. ; G. F. Rowbotham Manchester ; E. A. Rucker, Middlesex ; E. J. Ryan-MacMahon, St. Thomas's ; M. B. Seng and E. C. Seward, Guy's ; H. M. Shelley, Sheffield ; A. E. Sherwell, Bristol ; A. S. Simpson, King's Coll. ; A. D. H. Simpson, St. Bart.'s ; T. H. Sims, Cambridge and St. Thomas's ; A. E. Slinger, King's Coll. ; A. J. D. Smith and A. W. H. Smith, St. Bart.'s ; R. H. Smith, Manchester ; L. Spira, Vienna and Prague ; W. R. Spurrell, Guy's ; B. G. Staniland, London ; R. S. Starkey, Cambridge and St. Thomas's ; L. Statnigrosh, Middlesex ; Edith E. Stephens, Royal Free ; E. B. Strauss, King's Coll. ; T. R. Sutherland, Cambridge and St. Bart.'s ; Annie Sydenham, Royal Free ; G. Taylor, St. Mary's ; Portia K. Taylor, Univ. Coll. ; C. Thomas, London ; E. J. Thomas, Cardiff and St. Thomas's ; Mary Thomas, Univ. Coll. ; O. F. Thomas, Manchester ; K. W. Thorp, Cambridge and St. Thomas's ; D. S. Todd-White, Guy's ; J. R. Tree, Middlesex ; D. C. Vaughan, Manchester ; H. F. Walker, Middlesex ; J. L. le C. Walker, Guy's ; Florence M. Wallen, Cardiff ; S. E. Walmsley, St. Bart.'s ; Y. S. Wan, Cambridge and St. Bart.'s ; Dorothy A. Waterfield, London ; H. J. W. J. Westlake, Guy's ; J. M. F. Whitby, St. Thomas's ; Fanny M. Whittaker, Charing Cross ; Marian E. Williams, Royal Free ; Dorothy Winstanley, Liverpool ; A. W. Wood, Birmingham ; Dorothy Wood, Charing Cross ; Isabelle J. Woodhouse, Royal Free ; H. Yates, Cambridge and St. Thomas's ; Muriel M. Yates, St. Mary's ; and Z. M. Yusuf, St. Bart.'s.

ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH, ROYAL COLLEGE OF SURGEONS OF EDINBURGH, AND ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW.—The following candidates have passed the Triple Qualification Examination :—

FINAL EXAMINATION.

Eileen M. M. Macdonald, Annie D. Allen, Morton Kahn, James L. Connacher, Claudius D. Wickramasinghe, Maurice N. Gelb, Edward T. Hale, Lawrence A. Moody, Donald G. Coutts, Howard M. Jamieson, Cyril A. Paulusz, Martha D. Devon, Duncan R. Nicol, Herman S. N. Menko, William E. Haydon, Frederick N. Spittel, Peter M'Donald Milliard, Ruby S. Beveridge, Eliazer Gelfer, and James Reid.

Medicine.—James S. Allan, Andrew Bury, Kathleen M. R. Dunn, Charles M. Hinds, James A. Kerr, Dunstair D. S. Outschoorn, William R. Robertson, Herbert E. Schokman, Arthur H. Stephenson, San Hock Tan, John G. Thomas, and Joseph R. Whitaker.

Surgery.—Elizabeth Clark, Herbert M. Hobson, James A. Kerr, Richard F. Kerr, Arthur W. H. Noble, James Ryan, and Joseph R. Whitaker.

Midwifery.—James S. Allan, Andrew Bury, Kathleen M. R. Dunn, Charles M. Hinds, Herbert M. Hobson, Percy A. M. Jayewardeni, Ronald M. Mackinnon, Patel Shankerlal Hathibhai Masters, Dunstair D. S. Outschoorn, Don Swithin M. E. Perera, William J. Rankine, William R. Robertson, Alexander Ross, James Ryan, Herbert E. Schokman, Hariprasanna Sen, Arthur H. Stephenson, San Hock Tan, and John G. Thomas.

Medical Jurisprudence.—Alexander S. Ballantine, Sudhindra Nath Bandyapadhay, Vernon Bell, John S. Caldwell, Charles Campbell, Isaac Chesarki, Mollie F. Churcher, Frederick W. Duthie, Abraham M. Filer, Alexander J. M. Findlater, Rodney H. Holb, Joseph Horsham, Constance P. H. Hunter, John A. A. Hunter, Edward N. Jamieson, William A. Kemp, Douglas J. Kynock, Jemima M. M'Kendrick, Cecil J. R. Morrison, Constance C. Reid, William M. B. Rossie, William A. Rogers, Joseph F. Sweeney, San Hock Tan, Matthew M. Tannahill, Joseph R. Whitaker, Albert E. Williamson, and Archibald C. Young.

INTERNATIONAL UNION AGAINST TUBERCULOSIS.—The Council of Directors held its annual meeting in Paris on July 26th at the headquarters of the League of Red Cross Societies, when 20 members of the Council from different countries met under the presidency of Dr. Dewez, of Brussels. Prof. Léon Bernard, secretary-general, gave an account of the development of the Union since the Brussels conference. It was decided that the following questions should be placed on the agenda of the conference to be held at Lausanne in September, 1924 :—

1. Relations between pregnancy and tuberculosis, to be reported on by Prof. Forssner (Stockholm).
2. Do there exist naturally or can there be produced artificially saprophytic forms of Koch's bacillus which might become virulent tubercle bacilli ? Report by Prof. Calmette (Paris).
3. Effects of the organisation of the anti-tuberculosis campaign in different countries on the decrease in tuberculosis mortality. Report by Sir Robert Philip (Edinburgh).

The report of Prof. Besançon (Paris) on the question of the "Respective Value of Techniques for Research on Koch's Bacillus in the Diagnosis of Lesions in Human Tuberculosis" gave rise to an interesting discussion. This report will appear in the next number of the *Bulletin*.

NATIONAL MILK CONFERENCE.—The National Clean Milk Society has convened a conference on the subject of pasteurisation, to be held on Wednesday, Nov. 21st, 1923, n the Council Chamber of the Guildhall, London, E.C. Papers will be read on: (1) Methods and Processes of Pasteurisation; (2) Physical Changes (Cream Line, &c.); 3) Chemical Changes (Salts, &c.); (4) Bacteriological Changes; 5) Biochemical Changes; and (6) Financial and Commercial Aspect. A detailed programme will be issued later.

SALFORD MILK-SUPPLY.—That some real standard of cleanliness of milk is required is made evident by Mr. J. D. Elsdon, the Salford public analyst, in his annual report on the result of previous observations and of 497 samples of milk examined for sediment during the year. What is called a very lenient standard was fixed—viz., that those amples which give a sediment of more than 5 volumes per 00,000 were characterised as adulterated. Since 1915 528 samples of milk were examined, and of these 864 were ntirely free from sediment and 1136 contained between and 1 part of sediment per 100,000 parts of milk; thus 9 per cent. of the samples examined for dirt over a period of six years contained not more than 1 part of sediment per 00,000 parts of milk. Mr. Elsdon remarks that it would ppear, therefore, that a standard of not more than 1 part of sediment per 100,000 parts of milk would be perfectly air and that milk containing 2 or more parts per 100,000 hould be classified as unsatisfactory. Moreover, "the ubject is one of peculiar difficulty, as it is quite easy for the etailer to remove the bulk of the visible dirt by filtration r decantation immediately before selling the milk. The urchaser may think, therefore, that he is getting a clean, ure article, whereas a serious bacterial contamination, which is the usual concomitant of visible dirt, entirely scapes notice. During the year standards for various milks f special grades have been issued officially, but it seems most esirable that the ordinary milk sold to the public, which, fter all, will always constitute the bulk of the milk sold in his country, should be required to come up to some standard f cleanliness both physical and bacteriological, even if this tandard is, of necessity, lower than those for the special milks mentioned." Mr. Elsdon also states that of the amples of milk—923 in number—49, or 5·3 per cent., were dulterated.

MILK (SPECIAL DESIGNATIONS) AMENDMENT ORDER SCOTLAND), 1923.—The Scottish Board of Health has issued or the information of local authorities copies of an Order which gives effect to certain amendments on the principal Order, dated June 15th, 1923. These amendments are as ollows:—

(1) *Pasteurised Milk.*—The figures of the bacterial count pplicable to samples of pasteurised milk have been increased to) before Jan. 1st, 1924, not more than 200,000 bacteria per cm.; and (2) after Jan. 1st, 1924, not more than 100,000 acteria per c.cm. The Board are advised that if pasteurised milk is handled with proper precautions, the amended figures of he bacterial count should enable distributors to sell such milk nbottled.

(2) *Grade A Milk (Pasteurised).*—The bacterial count now pplicable to Grade A Milk (Pasteurised) is (1) before Jan. 1st, 924, not more than 50,000 bacteria per c.cm. and no coliform acillus in one-hundredth of a c.cm.; and (2) after Jan. 1st, 924, not more than 30,000 bacteria per c.cm. and no coliform acillus in one-tenth of a c.cm.

Further copies of the Order may be obtained through any ookseller, or direct from H.M. Stationery Office.

MIDDLESEX HOSPITAL MEDICAL SCHOOL.—The inter session, 1923–24, will open on Oct. 2nd at 3 P.M., hen the introductory address will be delivered at the cala Theatre by Mr. Somerville Hastings, on Team Work Nature, after which the prizes gained during the previous ear will be distributed by H.R.H. Princess Alice, Countess Athlone. The annual dinner will be held the same evening 7.30 at the Trocadero Restaurant, Sir John Bland-utton in the chair. Those wishing to be present at the nner should communicate as soon as possible with the cretary-superintendent of the hospital.

LONDON INTER-COLLEGIATE SCHOLARSHIPS BOARD. he following awards of medical scholarships and exhibitions ave been made on the results of the Board's examination eld in June:—University College: Bucknill Scholarip: J. R. Pierre, Royal College, Mauritius. Medical xhibitions: A. S. Hatch, Bishop's Stortford College; . Levy, Central Foundation School. Westminster Hospital edical School: Natural Science Scholarship: H. J. Shorvon, ast London College. London (R.F.H.) School of Medicine r Women: Mabel Sharman Crawford Scholarship: arguerite M. Fenn, Trinity Hall, Southport. St. Dunstan's edical Exhibition: Joyce R. Woods, City of London Girls' chool. Isabel Thorne Scholarship: Decima M. Tracey, amilton House School, Tunbridge Wells. Mrs. George M. mith Scholarship: Kathleen E. Gambrell, County Secondary chool, Streatham.

WELLCOME HISTORICAL MEDICAL MUSEUM.—The museum will be closed for cleaning from Sept. 1st to 30th inclusive.

SMALL-POX IN ENGLAND AND WALES.—The number of cases reported during the week ending August 4th was only 21. Of these, 15 were from Gloucestershire, 3 from Derbyshire, 2 from the West Riding of Yorkshire, and 1 from Notts.

CODE WORDS FOR MEDICAL TELEGRAMS.—In May last the faulty transmission of a code word by telegram led to tragic delay in administering diphtheria antitoxin to a 3-year old child. The Postmaster-General has announced the disuse for such urgent telegrams of the code words for "positive" or "negative," substituting the words "present" or "not found," in regard to which no confusion would be possible.

CANCER RESEARCH IN MANCHESTER.—By means of the munificent bequest of £5000 under the will of the late Mr. Hugh Fullerton for cancer research, and a recent gift of £1000 for similar purposes by Mr. and Mrs. Todman, of Sydney, the committee of the Manchester Christie Hospital finds itself in a position to supplement the research work conducted for many years by Dr. C. Powell White. Among other suggestions, the committee has had under consideration the offer of a "Fellowship" and hopes to be in a position to announce its decision during the autumn.

DEATH OF DR. J. FERGUSON.—John Ferguson, M.B., B.S. Lond., who died suddenly in London on August 13th, was a student at St. Bartholomew's Hospital and qualified in 1904, taking his London medical degrees three years later. He was in general practice at Cheam and surgeon to the Epsom and Ewell Cottage Hospital before coming to London to take up consulting work. He was a member of the Special Neurological Board of the Pensions Ministry at Cheltenham-terrace, Chelsea, and honorary physician to the Governesses' Benevolent Institution.

INDUSTRIAL WELFARE SOCIETY.—The society will hold its fourth annual lecture conference at Balliol College, Oxford, on Sept. 14th–19th. The conference will be open to men and women welfare supervisors; employers, heads of management, labour leaders, and others are attending these conferences in increasing numbers. The provisional programme includes the following items:—Friday, 14th: 7 P.M., dinner; 8 P.M., opening address by Mr. W. L. Hichens (chairman, Cammell Laird and Co., Ltd.). Saturday, 15th: Morning, paper: Modern Factory Administration, by Mr. A. D. Denning. Afternoon, practical demonstration in industrial psychology, by Miss May Smith (Industrial Fatigue Research Board). Sunday, 16th: Morning, paper: The Romance of the Factory Acts, by Miss Constance Smith (H.M. Deputy Chief Inspector of Factories). Monday, 17th: Morning, paper: Thrift Schemes in Industry, by Sir William Schooling (vice-chairman, National Savings Committee). Afternoon, paper: Welfare Possibilities, by Mr. Eldred Hallas (National Union of General Workers). Evening, papers: The Organisation of Leisure, by three supervisors. Tuesday, 18th: Morning, special session for welfare supervisors. Afternoon, paper: Training the Young Worker, by Mr. H. Schofield (Principal, Loughborough College). The inclusive fee for membership of the conference is 75*s.*, payable in advance to the Industrial Welfare Society, 51, Palace-street, Westminster, S.W. 1.

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith-road, W.

MONDAY, August 20th.—10 A.M., Mr. Maingot: Surgical Pathology. 12 noon, Mr. Simmonds: Applied Anatomy. 2 P.M., Mr. Addison: Surgical Wards.

TUESDAY.—10.30 A.M., Dr. Paterson: Medical Wards. 12 noon, Dr. Burrell: Chest Cases. 2 P.M., Mr. Banks-Davis: Throat, Nose, and Ear Dept.

WEDNESDAY.—10 A.M., Mr. Banks-Davis: Operations on Throat, Nose, and Ear. 2 P.M., Mr. Gibb: Eye Dept. 3 P.M., Dr. Pernet: Skin Dept.

THURSDAY.—10 A.M., Dr. Grainger Stewart: Neurological Dept. 12 noon, Mr. Simmonds: Demonstration of Fractures. 3 P.M., Dr. Scott Pinchin: Medical Out-patients.

FRIDAY.—10 A.M., Mr. Dudley Buxton: Dental Dept. 2 P.M., Dr. Burrell: Medical Out-patients. 2 P.M., Mr. Sinclair: Surgical Out-patients.

SATURDAY.—10 A.M., Medical Registrar: Diseases of Children.

Daily, 10 A.M. to 6 P.M. Saturdays, 10 A.M. to 1 P.M. In-patients, Out-patients, Operations, Special Depts.

Appointments.

Dickson, C., M.D. Belf., D.P.H., has been appointed Chief Medical Officer of the Irish Free State Post Office.

Edwards, T. P., M.D., B.S. Lond., D.P.H. Camb., Medical Officer of Health to Wrexham Urban and Rural District Councils.

Galloway, D. J., M.D. Edin., to be a Member of the Executive Council of the Straits Settlements.

Neil, W. F., F.R.C.S. Eng., one of the Medical Referees under the Workmen's Compensation Act, for County Court Circuit No. 18.

Southam, A. H., M.D., M.Ch. Oxf., F.R.C.S. Eng., one of the Honorary Surgeons to the Manchester Victoria Memorial Jewish Hospital.

Vacancies.

For further information refer to the advertisement columns.

Belgrave Hospital for Children, 1, Clapham-road, S.W.—H.P. and H.S. Each £100.

Birmingham, Children's Hospital.—H.P. and H.S. Each £100. Also R.M.O. £150.

Birmingham, Queen's Hospital.—Third P. for Out-patients. £50.

Blackburn County Borough.—Female Asst. M.O.H. £736.

Bristol Royal Infirmary.—Sen. Res. M.O. £300. Also H.P.'s, H.S.'s, each £120, and Dent. H.S., £156.

Burnley, Victoria Hospital.—H.S. £200.

Cape Town, Somerset Hospital.—Res. Med. Supt. £750.

Carlisle, Cumberland Infirmary.—Res. M.O. £175.

Chester Royal Infirmary.—Hon. Asst. Anæsthetist.

City of London Hospital for Diseases of Heart and Lungs, Victoria-park, E.—Half-time M.O. £200.

Colombo Municipality, Ceylon.—Third Asst. M.O.H. Rs. 9000.

Dumfries, Crichton Royal Mental Hospital.—Asst. P. £350.

East African Medical Service.—M.O. £600.

Hull Tuberculosis Sanatorium, Cottingham.—Res. Tub. O. £350.

Ipswich County Borough.—Asst. M.O.H., &c. £500.

Kent County Council.—Tuberculosis O. £696 4*s.* 8*d.*

Leamington Spa, Warneford, Leamington, &c., General Hospital.—Res. H.P. £150.

Leicester Royal Infirmary.—Locum Tenens Anæsthetist.

London Temperance Hospital, Hampstead-road, N.W.—H.P. £120.

Manchester, St. Mary's Hospitals for Women and Children.—Two H.S.'s. Each £50.

Manor House Hospital, Golders Green, N.W.—Jun. H.S. £150.

Miller General Hospital for South-East London, Greenwich-road, S.E.—Res. Cas. O. £200.

Reading, Royal Berkshire Hospital.—Hon. Asst. P. Hon. Asst. Anæsthetist. Also H.S. £150.

Royal Naval Medical Service.—Surgeon-Lieutenants.

St. Bartholomew's Medical College, E.C.—Demonstrator of Physiology.

Southampton, Royal South Hants and Southampton Hospital.—Jun. H.S. £150.

South London Hospital for Women, South Side, Clapham Common, S.W.—First H.S. £100. Second H.S. £50. Also H.P. £100.

Staffordshire Education Committee.—Two Asst. School Med. Inspectors. £600.

Warrington Infirmary and Dispensary.—Jun. H.S. £200.

Warrington, Lancashire County Mental Hospital, Winwick.—Deputy Med. Supt. £350.

Warwickshire, King Edward VII. Memorial Sanatorium, Hertford Hill, near Warwick.—Asst. Res. M.O. £350.

West African Medical Service.—M.O. £660.

West London Hospital, Hammersmith-road, W.—H.P.; also two H.S.'s. £100.

West Riding County Council.—School Med. Inspector. £500.

York City Mental Hospital, Fulford.—Locum Tenens. £7 7*s.* weekly.

The Chief Inspector of Factories, Home Office, London, S.W., announces a vacant appointment at Lydney (Gloucester).

Births, Marriages, and Deaths.

BIRTHS.

Haward.—On August 11th, at The Wold, Woldingham, Surrey, the wife of Walter Haward, M.B., B.S., of a daughter.

Saunders.—On August 10th, at Lyford-road, Wandsworth Common, the wife of Dr. R. J. Saunders of a daughter.

MARRIAGES.

Boobbyer—Shaw.—On August 7th, at Christ Church, Oxford, Philip Watson Boobbyer, B.A., M.B., B.Ch. Oxon., M.R.C.S., L.R.C.P., to Vera Elisabeth Shaw, M.R.C.S., L.R.C.P., second daughter of Bishop and Mrs. Shaw, of Christ Church, Oxford.

DEATHS.

Ackland.—On August 6th, at St. James'-court, S.W., Robert Craig Ackland, C.B.E., M.R.C.S., L.R.C.P., L.D.S., aged 58.

Stenhouse.—On August 10th, at St. Andrews-place, Lewes, John Robert Stenhouse, M.D. Lond., aged 52 years.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Comments, and Abstracts.

THE HYGIENE OF SWIMMING.

Some Feats of Endurance.

Prominence has been given to swimming as a pastime by the remarkable spell of hot weather in this country and by the fact that the English Channel has been crossed in the course of a single week by swimmers starting from either bank. The exploit of an Argentinian has easily broken all previous Channel records. The successful swims are now :—

Date of exploit.	Name of swimmer.	Age.		Distance traversed in miles.	Time.
1875 Aug. 24–25	Matthew Webb	27	Dover–Calais	45	21 h. 45 m.
1911 Sept. 5–6	Thos. Wm. Burgess	40	Dover–Calais	63	22 h. 35 m.
1923 Aug. 5–6	Henry Sullivan	34	Dover–Calais	56	26 h. 50 m.
1923 Aug. 11–12	S. Enrico Tiraboschi	35	Calais–Douvres	—	16 h. 23 m.

Captain Webb, the first champion, was 5 ft. 8 in. in height, weighed 14½ st., and had a chest measurement of 41½ in. He was freely anointed with porpoise grease before the swim but expressed a doubt whether this benefited him in any way. Much exhausted when he left the water, he yet felt as warm as when he started. He slept several times as he was being driven to his hotel, where his body temperature on arrival was found to be 98° F. On waking five hours later it was 101° F., his face was flushed, and his skin hot and dry. After further sleep he awoke apparently none the worse for his exertions except for stiffness of arms and legs and some trifling abrasions on the neck caused by the salt water. A sphygmographic pulse-tracing, however, which appeared in The Lancet of Oct. 16th, 1875 (p. 576) excited some comment on the sudden fall of the downstroke and the marked dicrotism. Mr. Burgess's achievement was the more remarkable in that he was almost 6 ft. in height and 13 years Capt. Webb's senior. He was rubbed all over with lard before entering the water. The only food which he partook during his swim consisted of Swiss milk chocolate, a few grapes, and the leg of a chicken. He was just able to walk ashore after his swim. Mr. Sullivan, who is a native of Lowell, Massachusetts, had made repeated attempts to swim the Channel from the age of 20 years. He only took nourishment once during his swim, and walked out of the water and re-embarked for Dover after two hours' rest. Sign. Tiraboschi swam fast and well throughout, drank some coffee at the critical stage of his journey, and did not seem in any distress on landing, when he was rubbed down, and within a quarter of an hour walked to the rowing boat which took him back aboard the French tug.

The Dangers of Swimming Pools.

Swimming has always taken a high place among healthy exercises. It is more and more pushed by organisers of physical training, and year by year the proportion of swimmers increases among the school-children in our inland industrial towns. It is therefore extremely important that the condition of the water in swimming baths and pools should be as pure as is reasonably possible. This point is raised by Public Health Bulletin No. 133, on the transactions of the third annual conference of State Sanitary Engineers, just issued by the Treasury Department of the U.S.A. A committee in 1921 issued questionnaires to all ear, eye, nose and throat specialists in the United States, and to a large proportion of the dermatologists asking for their experience of diseases thought to have been acquired either from the water, bathing suits, or towels used at swimming baths or pools. Seven hundred replies were received. Epidemics of mild and acute conjunctivitis were reported by 19 physicians from 12 cities in 8 States. Epidemics of furunculosis of the external ear, otitis media, and other ear infections were reported by 10 physicians from 11 cities in 9 States. Epidemics of colds, rhinitis, and sinus infections were reported by 4 physicians in 4 cities, and a similar number of epidemics of tonsillitis, pharyngitis, or laryngitis. Eight epidemics of skin infection were reported, of which two of impetigo and one of boils were attributed to infected water, while two of molluscum contagiosum, one of tinea cruris, and one of streptococcal infection were attributed to infected bathing suits and towels. One epidemic of typhoid fever was traced to a swimming pool at Louisville, Ky.; an epidemic of typhoid in a school camp was traced to bathing in a polluted stream, and another intestinal epidemic to a similar cause—a truly formidable list, even if the evidence in every case would not have convinced a court of justice. One case is mentioned where an investigation made in response to many complaints failed to find evidence of disease acquired from athing, but did find that the water was at times highly olluted. It appears from the report that regulations for he control of swimming pools and baths have been adopted n seven States. Liquid chlorine was used as a disinfectant n 27 out of 44 pools with regard to which information was upplied, but at 17 of these pools the bathers complained of he smell or taste or irritating effect of the treated water on he skin or eyes.

Hygienic Precautions.

Some aural surgeons regard public baths as a prolific ource of infected ears, witness the correspondence in our wn columns following on the announcement in 1921 of an pidemic of swimming-bath conjunctivitis and Eustachian atarrh at Freiburg i. B.[1] The tendency may be to blame he swimming bath overmuch, just as in the early days of anitation a large proportion of illness was quite unwar-antably put down to defective drains. Then most drains ere defective and now a large proportion of the population se swimming pools. Much attention is being given to nproving the water of these pools; following the example f Poplar, chlorination and continuous filtration have been uccessfully adopted at many of them. The deputy city ngineer of Hull, Mr. T. Thomas, told the recent Sanitary nstitute Congress that Hull has now three continuous ltration plants, and he referred to the Bermondsey plant hich had been working satisfactorily at the Rotherhithe aths since 1906. Swimming should be encouraged, and ttention concentrated on improving the conditions which many cases do not come effectively under the purview f the medical officer of health. This is a matter which the inistry of Health might usefully take up. School medical fficers have the opportunity of noticing any deleterious ffects of the ever-increasing use of public baths by school-hildren. Visitors to the Sanitary Congress at Scarborough his year saw the splendid open-air swimming pool con-tructed by the corporation; a similar pool is nearing ompletion at Cleethorpes. Every seaside resort worthy f the name should have an open-air swimming pool con-aining water above suspicion.

PUBLIC HEALTH IN CAIRO.[2]

THE population of the city of Cairo at the middle of 1920 as estimated at 761,300, of whom 72,770 were "foreigners," at is (presumably), non-Egyptians (including H.E. the igh Commissioner and the author of this report). It is ated, however, that this estimate (which is a reduction f 387 below the 1917 census) must be considerably below the ctual number of inhabitants, as the city has never been ore crowded than in the year under review. Also, the illage of Kafr-el-Gamûs, with a population of 1200, has been dded to the Cairo circumscription during the year; and hat is termed "Greater Helwân," embracing a considerable rea "attached to the city for all public health purposes, cept the registration of births and deaths," with an stimated population of 24,641, brings up the total of Cairo habitants to 785,941, upon which figure the zymotic iagrams are based. The birth-rate was 47·3 per 1000, as gainst 42·0 in 1919 and the same for the quinquennium; usual, there were great variations in different parts of the ty: in Bulâq the ratio was 59·5, in Esbekiya (the European arter) only 33·1. The death-rate (after deducting 1082 eaths of non-residents) was 36·3 per 1000, as compared with ·4 in 1919, 49·4 in 1918, and 40·5, the quinquennial mean. he highest district rates were registered in Bulâq (44·6), ld Cairo (44·0), and Khalifa (42·3); while in Helwân and sbekiya the ratios were only 27·0 and 27·7 respectively. he total number of infantile deaths (after deducting 178 in arious institutions, of children from outside Cairo) was 64, being in a ratio of 255 per 1000 births, as compared with 8 in 1919, and 329 in 1918. In Musky and Helwân stricts the ratios were 204 and 212 respectively; in Bulâq d Old Cairo they were 288 and 301. The main cause of eath was diarrhœa, which was very prevalent in the hot eather, the mortality being over 30 per cent. of births om the middle of May to the middle of August.

Infectious Diseases.

For infectious diseases as a whole there was a very notable provement over the experience of the two preceding years; e notifications of the eight principal diseases being only 155 per 1000, as compared with 11·659 in 1919, and 10·535 1918; the corresponding death-ratios were 1·899, 5·051, d 4·328 per 1000. For small-pox there were only 157 cases corded (0·199 per 1000), with 50 deaths (0·063 per 1000); t the fatality was high (31·8 per cent.), suggesting that any cases were not reported; indeed, 41 out of these 50 eaths were only diagnosed post mortem, as there had been medical attendance. In 1919 there had been 1455 cases ·851 per 1000) and 494 deaths (0·628). It is noteworthy that in the Musky district, where the small-pox death-rate (1·382 per 1000) had been much higher than in any other district of the city in 1919, only eight cases occurred, and not a single death, during the year under report. Possibly vaccination had been resorted to. There was a considerable increase in measles, both in cases (1·685 per 1000) and in deaths (0·514), as compared with the 1919 ratios (0·914 and 0·402); in Saiyeda Zenab the death-rate was 1·1, and in Darb-el-Ahmar 1·749 per 1000. Scarlet fever caused only four deaths in 39 cases. Diphtheria showed a considerable decrease, 0·418 cases and 0·097 deaths per 1000; 37 out of the total 329 cases, and 26 out of the total 77 deaths occurred in Darb-el-Ahmar ward (Rue de la Citadelle); while in Bab-el-Shariya and Helwân there was not a single death. Typhoid fever also was much less prevalent; the total cases numbered 925, less than in any year since 1913, the morbidity being 1·176 and the death-ratio 0·273 per 1000; the case incidence varied from 0·478 in Gamaliya ward to 1·941 in Esbekiya and 2·084 in Wayli; but the highest death-rates were registered in Khalifa ward (0·460) and Old Cairo (0·553). There has been a considerable reduction during recent years in the case-mortality, or fatality ratio, which was 43·2 per cent. in 1916, 24·9 in 1919, and 23·2 in 1920; this may probably be due to more effective notification of cases, which, of course, is most important. Typhus fever was prevalent, but less so than in the two preceding years. The cases and deaths numbered 1606 and 705, giving ratios of 2·043 and 0·897 per 1000; in 1919 the relative ratios were 6·139 and 3·344: the case mortality was also lower, 43·9 compared with 54·5 per cent. Wayli and Saiyeda Zenab had the largest numbers of cases (198 and 182), but the Musky and Abdin had the highest relative case-incidence (3·138 and 2·663 per 1000), while Darb-el-Ahmar and Old Cairo had the highest death-rates (1·545 and 1·446), the highest fatality ratios occurring in Old Cairo (66·2 per cent.) and Gamaliya (65·8). It may be supposed that the mortality ratios in these diseases are more to be relied on than those of case-incidence. Relapsing fever caused 23 deaths (0·29 per 1000), nine of which occurred in Darb-el-Ahmar; and from cerebro-spinal fever there were 15 deaths (0·019 per 1000), nine of which also occurred in the same ward. There were 1587 cases of influenza with 130 deaths (0·165 per 1000); all the deaths, except eight, occurred between the middle of January and the middle of April; there were also 1518 deaths from pneumonia and broncho-pneumonia, many of these being, no doubt, due to influenza infection. Six cases of encephalitis lethargica were notified, of which five proved fatal. At Qantara three cases of malignant pustule on the cheek occurred among the troops in August, each patient having recently bought a shaving-brush, traced to the same consignment, which had been imported from Japan in June; on examination the medical officer found one of the brushes to be swarming with anthrax bacilli; this was fully confirmed by further examination of the stock of brushes, the unsold portion of which was bought up and destroyed, though, unfortunately, they had been widely distributed in the meanwhile. Subsequent consignments were examined before being released from the Customs, several of which were found to be infected. A law was promulgated forbidding the importation of shaving-brushes, unless accompanied by a certificate from a competent authority of the country of manufacture that efficient disinfection had been carried out, and authorising the destruction of infected consignments, as well as prohibition of importation, if considered necessary.

During the year 1920, 25,169 rooms and 241,760 articles of clothing were disinfected by the Abbasiya and Fum-el-Khalig services, formalin, sublimate solution, and cyllin being used for the premises, and steam for the clothing. A "delousing campaign" was also instituted against typhus and relapsing fever, the number of contacts deloused being 1979. At the Government Fever Hospital, Abbasiya, there were 3152 admissions, as compared with 5530 in 1919; the chief diseases treated were typhus (918 admissions), relapsing fever (568), influenza (546), typhoid (172) and small-pox (109); the case-mortality ratios were 27·7, 1·2, 1·2, 32·5, and 32·1 per cent. respectively. The number of uncertified deaths which required investigation because there had been no medical attendance during the last illness was 18,814—that is, 68·1 per cent. of the total deaths that occurred in the city; this ratio is lower than in any recent year (since 1913), but still very high; in Bulâq, Old Cairo, and Khalifa districts the ratios were 83·4, 84·4, and 85·6 per cent.; in Esbekiya only 23·3 per cent.

Preventive Measures.

The condition as regards infant vaccination does not appear to be quite satisfactory; there were 30,215 primary vaccinations of native children, which works out at 85·8 per cent. of the births, a fairly high and satisfactory ratio; but of the 656 children of foreign birth only 408 were vaccinated—that is, 62·2 per cent.; the nationality of these children is not stated. An important part of the public health organisation is that of the Passenger and Pilgrim Control Service; as many as 7951 persons arrived in Cairo from countries under supervision on account of being infected, a considerable increase on the arrivals (4288) in the previous year. The largest numbers (2958 and 2301) came from Syria and Turkey; 58 per cent. landed at Alexandria and 32 per cent. at Port Said, the remainder at Suez. In addition 19,646 Egyptian Labour Corps men from the Canal Zone required to be observed on entering Cairo. The supervision of "unhealthy, inconvenient, and dangerous establishments" (such as bakeries, groceries, dyeworks, stables, &c.) is another important, and difficult, duty; the conditions were found to be faulty in only 6·60 per cent. of the 14,667 inspection visits, an increase, however, on the ratio (5·5) in 1919; bakeries (26·8 per cent.) and confectionery establishments (22·0 per cent.) were the worst; but among the grocers (4613) and butchers (3558), which between them compose more than half the total, faulty conditions were found in only 4·0 and 1·1 per cent. respectively; even in dairies and milkshops not more than 14·6 per cent. were found to be unsatisfactory. At all police stations and outposts suitable arrangements have now been made for the reception and examination of injured persons, and police officers have been instructed in the elements of first-aid; a specially arranged medical chest has also been supplied for each fire-brigade motor. All men joining the police force are now vaccinated, and an anti-lice campaign has been instituted as a protection against typhus and relapsing fever. The amount of medical work carried out by the police medical officers appears to have been very considerable; as many as 8036 examinations of persons were made for injury or supposed injury (compared with 6029 in the previous year); 2088 cab-drivers and carters were examined for the Traffic Office, and 3219 *ghafirs* on account of sickness. Anti-mosquito work was carried out in certain selected areas where the inhabitants allowed access to their premises for dealing with possible breeding places; the Gezira area has benefited materially by the drainage work carried out in 1919–20. At Helwân *Culex* is found in the town almost exclusively and *Anopheles* in the outskirts.

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[1] THE LANCET, 1921, ii., 519 et seq.

[2] Government Press, Cairo. 1921.

At the conclusion of this most interesting report, Dr. P. G. S. Williams, medical officer of health for the city, mentions a measure likely to prove of great value to the public health that is being carried out in the smaller streets of the native quarters; this consists in laying down a paving of cubical stone setts, placed upon a clean sand foundation, and giving an impermeable surface, which can be kept clean. An improvement in the health of the inhabitants may be hoped for in the quarters so dealt with, and especially in the incidence of infantile diarrhœa. The report is well illustrated with diagrams and tables, and extremely well printed; the addition of a plan of the city, showing its present divisions, might be suggested.

THE EFFECT OF BACTERIAL EXTRACTS ON BLOOD-SUGAR.

IT is well known that substances such as peptone and certain proteins contained in yeast will lower blood-sugar when injected subcutaneously. Hopes were raised early in the year that "yeast insulin" might prove an effective remedy and that quantities of it would be available for clinical trial in the near future. In the current issue of *Nature* Messrs. L. B. Winter and W. Smith report briefly on their further work at the Biochemical Laboratory in Cambridge. They have now obtained from the action of micro-organisms, other than yeast, extracts which lower the level of blood-sugar in normal animals to a point where convulsions occur. These convulsions were relieved by injection of glucose, so that it is presumed they were not due to toxic substances in the injections. Such extracts seem to lower the level of blood-sugar for a longer time than does insulin itself, and it remains to be seen whether they can be utilised in the treatment of diabetes. Experiments to this end are being continued and will be followed with interest.

TO PARENTS OF DEFECTIVE CHILDREN.

A LITTLE book entitled "Opening Doors" (London and Edinburgh: Oliver and Boyd. 1923. Pp. 20. Cloth 1*s*. 6*d*., paper 6*d*.) has been written by Dr. John Thomson for the mothers of mentally defective infants "in the hope that it may provide them with some of the instruction and encouragement of which they are often much in need." In the early months of a baby's life it is the mother who almost invariably has the best and sometimes the only opportunity of discovering whether her baby's development differs from that of a normal infant; and where this is the case there are many ways in which she can help him, many doors which she can at least place ajar for him, if any abnormality present be recognised sufficiently early. At present, as Dr. Thomson points out, a large proportion of mentally defective children begin to be educated for the first time when they are between 5 and 7, having had practically no training during the earlier and more receptive years of life; and the circulation of information of the kind contained in this book cannot but make the subsequent training of such children easier. The advice given is simple but eminently practical, and is so worded as not to offend the most susceptible of mothers. She is shown what she can do for her baby if he is forming bad habits; if he is doing or noticing too little; if he is late in speaking, cries constantly, or has fits; and how she can strengthen his character and keep him strong and well. Suggestions are given for the special treatment of children whose limbs are stiff, these including active and passive movements, as well as a number of miscellaneous common-sense hints. The value of this small book is out of all proportion to its size, and it should meet with a warm welcome not only from mothers, but also from child welfare workers, nurses, and even doctors.

A TUBERCULOSIS DIRECTORY.

A FOURTH edition has just appeared of the useful Handbook of Tuberculosis Schemes, issued by the National Association for the Prevention of Tuberculosis (20, Hanover-square, London, W. 1. 10*s*. 6*d*., post free). Its aim is to give ready and trustworthy information regarding the operation of tuberculosis schemes and other tuberculosis activities throughout Great Britain and Ireland, to produce, in fact, a tuberculosis directory as far as mortality and provision for control and treatment are concerned. Any complete tuberculosis scheme, as the foreword indicates, includes the operations of a care-committee, and it is satisfactory to note that in a number of instances local authorities have frankly coöperated with voluntary agencies and have included in their schemes institutions established and maintained on voluntary lines. The Handbook now contains a number of tables and graphs effectively showing the varying death-rates in counties and boroughs for the year 1922. It will be found helpful by all who are interested in the development and administration of sound anti-tuberculosis measures.

THE SAN FRANCISCO MEDICAL MEETING.

THE recent annual meeting of the American Medical Association at San Francisco was attended by over 3750 medical men, this number exceeding that of 1915—when the Association last met in that city—by nearly 1500. The extensive publicity given by the press to the proceedings of the session is believed by Californian physicians to have been of great service in combating the advertising of non-medical cults which are particularly powerful in that State. The sessions of the House of Delegates, the governing body of the Association, were fully and closely attended, and many problems of professional and public importance were discussed. An innovation was introduced in the shape of clinics held in connexion with the meeting, both before and after it, throughout the Pacific Coast and Western States, in order to bring home the scientific work of the Association to those who were unable to be present at the actual gathering in San Francisco. At the first meeting of the House of Delegates on June 25th the Speaker, Dr. Frederick C. Warnshuis, of Grand Rapids, Mich., claimed that certain members and parts of the Association had during the past year used the promulgation of public health measures as an excuse to justify "the institution of socialised medicine for all classes of society," and that on that account "condemnation and ridicule are directed to the profession as a whole." If unity of purpose was to be nullified by the acts and attitude of certain special groups of members, the Association might as well withdraw from the public arena and concern itself only with purely scientific topics. Others of Dr. Warnshuis's recommendations referred to increased representation of the Association in the group of medical authorities who have been discussing, and are again expected to discuss, the organisation of a national welfare department in Washington, and to the cessation of any necessity for the Red Cross organisation to enter into public health or community clinic work. Dr. George E. de Schweinitz, of Philadelphia, President of the Association, spoke in his address of the ever-present question of the time which should be devoted to specialties in the undergraduate curriculum, and suggested that from the central offices of the Association a questionnaire of wide scope should be sent to graduates of representative schools of medicine in various parts of the country prior to the next meeting on medical education, and that an analysis of the replies received should be presented as a basis of discussion. Dr. Ray Lyman Wilbur, of California, President-elect, emphasised the necessity in medical affairs of decentralisation of organisation, in order that the special needs of each State might be met by those who best knew its problems. Dr. Wilbur also referred to the increasing interest throughout the country in the practice of periodical physical examination; the doctor trained to thinking in terms of disease must, he said, turn his attention to thinking in terms of being well.

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CONTENTS.

THE WHOLE OF THE LITERARY MATTER IN THE LANCET IS COPYRIGHT.

STUDENTS' GUIDE.

SESSION 1923–1924 371

GENERAL MEDICAL COUNCIL 371

MEDICAL EXAMINING BODIES AND SCHOOLS OF THE UNITED KINGDOM.

A GUIDE TO FACILITIES FOR OBTAINING VARIOUS MEDICAL DEGREES AND OTHER QUALIFICATIONS FOR BRITISH MEDICAL REGISTER.

I.—ENGLAND AND WALES.

THE UNIVERSITIES.

University of Oxford 373
  Radcliffe Infirmary and County Hospital 374
University of Cambridge.. 374
  Addenbrooke's Hospital 375
University of London 375
  Medical Schools:
  St. Bartholomew's Hosp. and College 376
  Charing Cross Hospital.. 377
  St. George's Hospital ... 377
  Guy's Hospital 377
  King's College 378
  King's College Hospital Medical School 378
  London Hospital 379
  St. Mary's Hosp. Med. Sc. 379
  Middlesex Hospital 379
  St. Thomas's Hospital .. 380
  University College 381
  University College Hosp. Medical School 381
  Westminster Hospital .. 382
  London (R.F.H.) School of Medicine for Women 382
University of Durham 383
  College of Medicine, Newcastle-upon-Tyne 384
  Newcastle-upon-Tyne Royal Victoria Infirm. 384
University of Birmingham 384
  Birmingham Gen. Hosp. 385
  Queen's Hospital 385
  Birmingham and Midland Eye Hospital 385
University of Liverpool ... 386
  Royal Infirmary 386
  David Lewis Northern Hospital 386
  Royal Southern Hosp. .. 386
  Stanley Hospital 386
Victoria University of Manchester 386
  Manchester Royal Infirm. 387
  Manchester Children's Hospital 388
  Manchester Northern Hospital for Women and Children 388
University of Leeds 388
  Leeds General Infirmary 388
University of Sheffield 388
  Royal Infirmary 389
University of Bristol 389
  Bristol Royal Infirm. and Bristol General Hosp. 389
University of Wales 390
  University College, Cardiff 390
  King Edward VII. Hospital, Cardiff 390
  Swansea General and Eye Hosp.& Swansea Hosp. Convalescent Home .. 390

ENGLISH MEDICAL CORPORATIONS GRANTING DIPLOMAS.

Examining Board in England by Royal College of Physicians of London and Royal College of Surgeons of England 390
Royal College of Physicians of London: Membership and Fellowship 392
Royal College of Surgeons of England: Fellowship 392
ociety of Apothecaries of London 392

METROPOLITAN ANCILLARY SCHOOLS AND HOSPITALS AFFORDING FACILITIES FOR CLINICAL OBSERVATION:

Seamen's Hosp. Society 393
West London Hospital.. 393
Royal Northern Hospital 393
Prince of Wales's General Hospital 393
London Temperance Hospital 394
Hampstead General and N.W. Lond. Hospital. 394
South London Hospital for Women 394
French Hospital and Dispensary 394
Italian Hospital 394
German Hospital 394
National Hospital for the Paralysed and Epileptic 394
Hospital for Epilepsy and Paralysis, &c. 394
West End Hospital for Nervous Diseases 394
Bethlem Royal Hosp... 394
Hospital for Consumption and Diseases of Chest, Brompton 394
City of London Hospital for Diseases of Heart and Lungs 395
Royal Chest Hospital .. 395
Mount Vernon Hospital for Tuberculosis and Diseases of Lungs and Heart, Northwood ... 395
Queen Charlotte's Lying-in Hospital and Midwifery Training School 395
Hospital for Women ... 395
Samaritan Free Hospital for Women 395
East London Hospital for Children and Dispensary for Women 395
Hospital for Sick Children 395
Evelina Hospital for Sick Children 396
Victoria Hospital for Children 396
Queen's Hospital for Children 396
Belgrave Hospital for Children 396
Alexandra Hospital for Children with Hip Disease 396
Royal London Ophthalmic Hospital 396
Royal Westminster Ophthalmic Hospital 396
Royal Eye Hospital 396
Central London Ophthalmic Hospital 396
Western Ophthalmic Hospital................ 397
National Hospital for Diseases of the Heart. 397
Hospital for Diseases of the Throat 397
Central London Throat, Nose, and Ear Hospital 397
Metropolitan Ear, Nose, and Throat Hospital.. 397
Royal Ear Hospital 397
St. Mark's Hosp. for Cancer, Fistula, and other Diseases of Rectum 397
St. Peter's Hospital for Stone and other Urinary Diseases 397
St. John's Hospital for Diseases of the Skin .. 397
London Lock Hospital and Home 397

ENGLISH PROVINCIAL ANCILLARY SCHOOLS & HOSPITALS:

Bath Royal United Hosp. 398
Bedford County Hosp... 398
Bradford Royal Infirm. 398
Royal Sussex County Hospital 398
Kent and Canterbury General Hospital 398
Coventry and Warwickshire Hospital 398
Derbyshire Royal Infirm. 398
Royal Devon and Exeter Hospital 398
West of England Eye Infirmary 398
Gloucestershire Royal Infirm. & Eye Institn. 398
North Staffordshire Infirm 398
Hull Royal Infirmary .. 398
Leicester Royal Infirm. 398
Northampton Gen. Hosp. 399
Norfolk and Norwich Hospital 399
Nottingham General Hosp 399
South Devon and East Cornwall Hospital ... 399
Royal Hosp., Portsmouth 399
Royal Berkshire Hospital 399
Salisbury General Infirm. 399
Royal Salop Infirmary . 399
Royal South Hants and Southampton Hosp. .. 399
Staffordshire Gen. Infirm. 399
Royal Hants County Hospital 399
Wolverhampton and Staffordshire Gen. Hosp... 399
Worcester General Infirm. 399
York County Hospital .. 399

School of Pharmaceutical Society of Great Britain 399

II.—SCOTLAND.

THE UNIVERSITIES.

University of Edinburgh .. 400
  School of Medicine of the Royal Colleges 400
  Royal Infirmary 400
  Royal Hospital for Sick Children 401
  Eye, Ear & Throat Infirm. 401
University of Glasgow 401
  Anderson Coll. of Medicine 402
  St. Mungo's Coll. and Glasgow Royal Infirm. 402
  Queen Margaret College 402
  Royal Infirmary 402
  Glasgow Western Infirm. 402
  Royal Hospital for Sick Children 403
  Glasgow Royal Maternity and Women's Hospital 403
  Royal Samaritan Hospital for Women 403
  Glasgow Lock Hospital . 403
  Glasgow Ophthalmic Institution 403
  Glasgow Eye Infirmary . 403
  Glasgow Hospital for Diseases of the Ear, Nose, and Throat 403
University of St. Andrews (United College, St. Andrews & University Coll., Dundee) 403
  University College 404
  Royal Infirmary 404
University of Aberdeen ... 404
  Aberdeen Royal Mental Hospital 405

SCOTTISH MEDICAL CORPORATIONS GRANTING DIPLOMAS.

Royal Coll. of Physicians of Edinburgh, Royal Coll. of Surg. of Edinburgh, Royal Faculty of Physicians and Surgeons of Glasgow .. 405
Royal Coll. of Physicians of Edinburgh: Membership and Fellowship 406
Royal Coll. of Surgeons of Edinburgh: Fellowship 406
Royal Faculty of Physicians and Surg. of Glasgow ... 406

Scottish Provincial Ancillary Schools & Hospitals 407

III.—IRELAND.

THE UNIVERSITIES.

Univ. of Dublin, Trinity College: School of Physic 407
National Univ. of Ireland 407
  University Coll., Dublin 407
  University Coll., Cork: School of Medicine ... 408
  University Coll., Galway: School of Medicine ... 409
Queen's Univ., Belfast 409

IRISH MEDICAL CORPORATIONS GRANTING DIPLOMAS.

Royal Coll. Phys., Ireland 411
Royal Coll. Surg., Ireland 411
Royal Coll. Phys., Irel., and Royal Coll. Surg., Irel. 411
Royal Coll. of Surgeons in Ireland (Schools of Surg.) 412
Apothecaries' Hall of Ireland 412

HOSPITALS AFFORDING PRACTICE RECOGNISED BY IRISH UNIVERSITIES & CORPORATIONS:

Sir Patrick Dun's Hospital 412
Coombe Lying-in Hosp. and Guinness Disp. .. 412
Adelaide Hospital...... 413
Jervis-street Hospital .. 413
Mater Misericordiæ Hospital 413
Meath Hosp. and County Dublin Infirmary 413
Mercer's Hospital 412
National Maternity Hospital 413
Richmond, Whitworth, and Hardwicke Hosps. 413
Rotunda Hospital...... 413
Royal City of Dublin Hospital 414
Royal Victoria Eye and Ear Hospital 414
Dr. Steevens' Hospital.. 414
St. Vincent's Hospital and Dispensary 414

DENTAL SURGERY.

The Dental Board of the United Kingdom 432
Registration of Dental Students 432
The Examining Bodies in Dentistry 433
Teaching Institutions in Dentistry 438

LEADING ARTICLE.

THE OUTLOOK IN MEDICINE 415

SPECIAL ARTICLES.

Diplomas in Psychological Medicine.............. 414
Naval Medical Service.... 416
Army Medical Service 418
Indian Medical Service.... 420
Women's Medical Service for India.............. 421
Air Force Medical Service 422
Colonial Medical Service .. 423
Diplomas in Tropical Medicine 427
Diploma in Ophthalmic Medicine 428
Diplomas in Public Health 428
Diploma in Radiology.... 432

MEDICAL NEWS

University of London 432
Formaldehyde 432
Westminster Hospital 438
Small-pox in England and Wales 138
Lancashire and the Spahlinger Treatment 438
Sleep in Churches........ 438

Medical Diary 438
Births, Marriages, Deaths . 438

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STUDENTS' GUIDE—SESSION 1923-1924.

THE scheme upon which the Students' Number of THE LANCET is constructed will make it easy, we hope, or all who consult it to find what they seek. The General Council of Medical Education and Registration s the controlling authority of all the medical and dental education of the country, and its responsibility for he upkeep of the Medical Register and for the maintenance of the examination standard is first explained.

But the student has to be taught as well as examined, and as the systems under which instruction can be btained do not conform to one pattern, the various curricula are described in detail, and under their espective headings the necessary information will be found concerning the facilities for medical study offered t the different teaching centres of the United Kingdom. The regulations for the examinations, both reliminary and professional, at these centres are set out so that the student desiring to obtain a medical legree from any university, or a diploma from any medical corporation, may ascertain the course of clinical nstruction and the conditions under which submission for examination has to take place. The metropolitan nedical schools and hospitals are grouped under the University of London, of which they are constituent odies, although their educational opportunities are offered to students of other universities as well as to those eeking the qualifications of the medical corporations. A similar plan is adopted in dealing with the provincial niversities, the hospitals in direct connexion with which are described with the universities; the hospitals nay not be official schools of the universities. but they supply an integral section of the teaching required.

Upon securing degrees or diplomas admission to the Register follows, and greater education begins. he prudent young doctor already knows what he or she desires to make the next step, and there is a arge range of choice displayed. The inducements to enter one of the Services should prevail more than hey have done of recent years. An account is given of the conditions under which commissions can be btained in the Navy, Army, Indian, and Air Force Medical Services, and in the Colonial Medical Service.

ENERAL COUNCIL OF MEDICAL EDUCATION AND REGISTRATION OF THE UNITED KINGDOM.

OWERS, DUTIES, AND CONSTITUTION OF THE GENERAL MEDICAL COUNCIL.

THE powers and duties of the General Medical ouncil, or "General Council of Medical Education nd Registration of the United Kingdom" to give the ouncil its full title, have been set out in detail in nany previous Students' Numbers of THE LANCET. t is first a registering body: no person, even though is qualifications have been obtained by examination, a legally qualified medical practitioner until his ame appears on the Medical Register. Secondly, it is standardising body, ensuring that medical education reaches an efficient standard by scientific xamination. Thirdly, it is a penal and disciplinary ody, having power to remove from the Register any ractitioner adjudged guilty of conduct "infamous a a professional respect." Fourthly, to the Council committed the codification of pharmaceutical emedies. The duties of the Council are thus primarily f a public nature, and its construction shows its tness for its fourfold responsibilities.

The Council at present consists of 38 members, f whom, as will be seen by the annexed list, all but 1 are official representatives of some corporate body. ive members are chosen by the Crown on the advice f the Privy Council, and six others are elected by he members of the medical profession as Direct epresentatives. There are also three additional embers appointed by the Privy Council under the entists Act, 1921, under which the powers and uties of the General Medical Council with regard to e keeping of the Dentists Register and the administration of the Dentists Acts were largely transferred to e Dental Board of the United Kingdom (see p. 432).

President of the General Council: Sir Donald acAlister. Members of the General Council: Sir umphry Rolleston, chosen by the Royal College of hysicians of London; Mr. H. J. Waring, F.R.C.S., oyal College of Surgeons of England; Dr. Benjamin loomfield Connolly, Apothecaries' Society of London; r. Arthur Thomson, F.R.C.S., University of Oxford; r. Wynfrid Laurence Henry Duckworth, University Cambridge; Dr. Robert Howden, University of urham; Sir Sydney Russell-Wells, University of ondon; Dr. Robert B. Wild, Victoria University of anchester; Sir Gilbert Barling, University of irmingham; Dr. Richard Caton, University of iverpool; Dr. Thomas Wardrop Griffith, University Leeds; Mr. John Beresford Leathes, M.B., University of Sheffield; Sir Isambard Owen, University of ristol; and Dr. David Hepburn, University of Wales. Dr. William Russell, chosen by the Royal College of Physicians of Edinburgh; Sir James Hodsdon, Royal College of Surgeons of Edinburgh; Dr. James Alexander Adams, Royal Faculty of Physicians and Surgeons of Glasgow; Dr. H. Harvey Littlejohn, University of Edinburgh; Sir Donald MacAlister, University of Glasgow; Dr. Matthew Hay, University of Aberdeen; and Dr. John Yule Mackay, University of St. Andrews. Sir John William Moore, chosen by the Royal College of Physicians of Ireland; Sir Arthur Gerald Chance, Royal College of Surgeons in Ireland; Dr. Edward Magennis, Apothecaries' Hall of Ireland; Dr. Andrew Francis Dixon, University of Dublin; Dr. Denis Joseph Coffey, National University of Ireland; and Mr. Thomas Sinclair, F.R.C.S., Queen's University of Belfast. Nominated by His Majesty, with the advice of his Privy Council: Sir Francis Henry Champneys, Sir George Newman, Sir Nestor Tirard, Sir Leslie Mackenzie, and Sir Edward Coey Bigger. Elected as Direct Representatives: Dr. J. A. MacDonald, Sir Thomas Jenner Verrall, Dr. Robert A. Bolam, Mr. E. B. Turner, Sir Norman Walker, and Dr. Leonard Kidd. Treasurers of the General Council: Mr. H. J. Waring and Sir George Newman. The three additional members are Mr. William Henry Dolamore, M.R.C.S., L.D.S.; Mr. William Henry Gilmour, M.D.S., L.D.S., and Mr. William Guy, F.R.C.S.E., L.D.S.

THE EDUCATIONAL CURRICULUM.

Professional Education.—The course of professional study after registration occupies at least five years. The Final Examination in Medicine, Surgery, and Midwifery must not be passed before the close of the fifth academic year of medical study.

The following are the General Medical Council's Regulations in regard to the registration of medical students which came into force on Jan. 1st, 1923.

Registration of Medical Students.

1. Subject to such exceptions as the Council may from time to time allow, every medical student, at the commencement of his studies, should be registered in the manner and under the conditions hereinafter set forth.

2. Before registration as a student every candidate should produce evidence that he has attained the age of 17 years.

3. The minimum standard of General Education required is that of University matriculation or entrance examination in the Faculties of Arts or Pure Science.

4. Before registration as a student every applicant should be required to have passed an approved examination n general education, and, in addition thereto, an examination in elementary physics and elementary chemistry conducted or recognised by one of the licensing bodies.

University of Oxford: Radcliffe Infirmary and County Hospital.—Courses of instruction are given in connexion with the Oxford University Medical School. These include (1) a course in Practical Medicine by the Regius Professor of Medicine; (2) Clinical lectures by the Litchfield Lecturers in Medicine and Surgery; and (3) tutorial instruction and demonstrations in special Regional Anatomy (medical and surgical), methods of Medical and Surgical Diagnosis, and Surgical Manipulation. (4) Pathological demonstrations and instruction in post-mortem work are given by the Assistant Pathologist. Opportunities are offered to students who wish to act as surgical dressers and clerks. The hospital contains 210 beds. In connexion with the hospital there is usually held in each year during October a post-graduate course, lasting a week.

UNIVERSITY OF CAMBRIDGE.

The student must enter at one of the Colleges, or as a non-collegiate student, and keep nine terms (three years) by residence in the University. He must pass the Previous Examination in Classics, Mathematics, &c., if possible, before he comes into residence in October, or he may obtain exemption through the Oxford and Cambridge Schools Examination Board, the Oxford or Cambridge Senior Local Examinations, the London Matriculation Examination, the Scotch Education Department, Responsions at Oxford, and the Joint Matriculation Board of the Universities of Manchester, Liverpool, Leeds, and Sheffield, the Matriculation Examination of the University of Birmingham, or by being a graduate of certain other Universities in the United Kingdom. He may then devote himself to medical study in the University, &c. Or he may, as nearly all students now do, proceed to take a degree in Arts by passing two Special Examinations for the ordinary B.A. degree, or an Honours degree in one of the Triposes. The Natural Sciences Tripos is taken most frequently, as some of the subjects are practically the same as those for the first and second M.B.

For the degree of *Bachelor of Medicine* (*M.B.*) five years of medical study are required either in Cambridge or at one of the recognised Schools of Medicine. The first three or four years are usually spent in Cambridge till the student has passed the examination for Part I. of the Natural Sciences Tripos and the first and second examinations for M.B. Hospital practice and many of the requisite lectures may be attended in Cambridge, and some students remain to attend lectures and hospital practice until they have passed the second part of the second examination for M.B. The laboratories for Botany, Chemistry, Physics, Biology, Zoology, Human Anatomy, Physiology, Biochemistry, Pathology, Bacteriology, Pharmacology, Psychology, and Public Health are well equipped. Addenbrooke's Hospital, the Infectious Diseases Hospital, the Cambridge Research Hospital, and the Field Laboratories are utilised for study and research.

There are three examinations for M.B. The *first* includes (1) General and Chemistry, (2) Mechanics, (3) Physics, and (4) Elementary Biology. These parts may be taken together or separately. The *second* is divided into three parts—viz., (1) Organic Chemistry, (2) Human Anatomy and Physiology; and (3) Pharmacology and General Pathology. The *third* is divided into two parts: (1) Principles and Practice of Surgery (including Special Pathology and Midwifery and Diseases Peculiar to Women); and (2) Principles and Practice of Physic (including Diseases of Children, Mental Diseases, Medical Jurisprudence), Pathology (including Hygiene and Preventive Medicine), and Pharmacology (including Therapeutics and Toxicology). The examinations are partly in writing, partly oral, and partly practical, in the hospital, in the dissecting room, and in the laboratories. An Act has then to be kept in the Public Schools, by the candidate reading an original dissertation composed by himself and being examined orally on some subject approved by the Regius Professor of Physic.

Candidates who have passed both parts of the third M.B. examination are admitted to the registrable degree of *Bachelor of Surgery* (*B.Ch.*) without separate examination and without keeping an Act.

The degree of *Doctor of Medicine* (*M.D.*) may be taken three years after that of M.B. or four years after that of M.A. The candidate is required to produce certificates of having been engaged in Medical Study for five years, and if an M.A., to pass the same examinations as are required for the degree of M.B. An Act has to be kept, consisting of an original Thesis sustained in the Public Schools with *vivâ voce* examination; and a short extempore essay has to be written on a topic taken from the general subject of his thesis, whether it be Physiology, Pathology, Pharmacology, the Practice of Medicine, State Medicine, or the History of Medicine.

For the degree of *Master of Surgery* (*M.Ch.*) the candidate must have passed all the examinations for B.Ch., or, if he is an M.A., have obtained some other registrable qualification in surgery. He is required to pass an examination in Principles and Practice of Surgery, Surgical Anatomy and Surgical Operations, and Pathology, and to write an extempore essay on a Surgical Subject. Before he can be admitted to the examination two years at least must have elapsed from the time when he completed all required for the degree of B.Ch.

New regulations for Medical and Surgical Degrees are being drafted, to come into force in October next.

Diplomas are granted in Public Health, in Tropical Medicine, in Medical Radiology and Electrology, and in Psychological Medicine. Candidates must hold a recognised medical qualification.

Women Students.—Increased facilities have been offered to students of Girton and Newnham Colleges, and they are admitted to the First and Second M.B. Examinations under certain conditions.

University Prize in Medicine.—The one University Prize in Medicine, the Raymond Horton Smith Prize (value £19), is awarded to that candidate for the degree of M.D. who presents the best thesis for the degree during the academical year, provided that he has taken honours in a tripos examination. Medical studies are endowed by the numerous Natural Science scholarships at the various colleges, information about which can be obtained from the respective Tutors.

An abstract of the Regulations and Schedules of the range of the examinations in Chemistry, Physics, Biology, Pharmacology, and General Pathology may be obtained upon sending a stamped directed envelope to the Registrary, The Registry, Cambridge.

Diploma in Medical Radiology and Electrology.—This Diploma is granted by the University of Cambridge. The primary object is to provide adequate training in a branch of medical work which is becoming increasingly important and difficult, and which is outside the ordinary medical curriculum. The Diploma is only open to those who hold a medical qualification, and includes a course of lectures and practical work in physics (Part I.), and in Radiology and Electrology (Part II.). Attendances at the necessary course of lectures in both subjects and in addition six months' clinical experience in an adequately equipped hospital recognised by the Committee is essential. The whole course of study takes six months, the lectures, practical work, and hospital attendance running concurrently. The Courses carried out by the University of Cambridge are at present arranged to begin early in January. Three months are spent in Cambridge doing the lectures and practical work in Part I., attending the systematic lectures in Part II., and the practice of Addenbrooke's Hospital, where there is a fully equipped and up-to-date X ray and Electrological Department. The remaining three months can be completed at any recognised hospital, but special arrangements are made for students to continue their studies in London, where demonstrations at various hospitals are arranged in order to give a wide experience. In addition, an independent course is arranged by the British Association of Radiology and Physio-Therapy. This Course is held entirely in London, but is recognised by the University as qualifying for the examination, and begins early in October. Further particulars as to the Cambridge Course can be obtained from Dr. F. Shillington Scales, Medical Schools, Cambridge, and of the London Courses from Dr. Stanley Melville, at the Offices of the B.A.R.P., 12, Stratford Place, London, W. 1.

ADDENBROOKE'S HOSPITAL.—Clinical Lectures in Medicine and Surgery, in connexion with Cambridge University Medical School, are given at this hospital twice a week during the academical year; and practical instruction in Medicine and Surgery is given in the wards and out-patients' rooms by the physicians and surgeons daily during the term time and vacations. The fee for pupilship is 3 guineas a term, 9 guineas a year, 12 guineas perpetual. Further information may be obtained from Dr. Aldren Wright.

UNIVERSITY OF LONDON.

The University of London was established by Royal Charter in 1836 as an examining and degree conferring body with affiliated colleges but no direct teaching functions. In 1900 it was reconstituted under the Act of Parliament, 1898, and became a teaching as well as an examining body. Many schools already existing became constituent colleges, including all the metropolitan medical schools. Lecturers were also appointed in special subjects.

Teaching Staff.—The teaching staff of the University is organised under two heads: 1. Appointed teachers—i.e., such as are appointed by the University. 2. Recognised teachers—i.e., those who have been appointed and are paid by the several schools of the University and other institutions at which instruction is given under the auspices of the University, and who have been recognised by the Senate as conducting work of University standard. Courses by non-recognised teachers may also be approved in schools of the University. The lecturers in the Medical Sciences and the professors in the Faculties of Medicine in University College, London, and King's College, London, will be found enumerated under their respective schools.

Internal and External Students.—All the examinations of this University are open to men and women alike. Matriculated students of the University may be either internal or external. Internal students of the University are students who have matriculated at the University and who are pursuing a course of study approved by the University, either (*a*) under the direct control of the University or a committee appointed thereby; or (*b*) under one or more of the appointed or recognised teachers of the University. Centres for preliminary and intermediate medical studies have been established by the University at University and King's Colleges. Internal students must pursue their studies at one of the above centres, or at one of the medical schools connected with the University. These are St. Bartholomew's Hospital, Charing Cross Hospital, St. George's Hospital, Guy's Hospital, King's College Hospital, the London Hospital, St. Mary's Hospital, the Middlesex Hospital, St. Thomas's Hospital, University College Hospital, Westminster Hospital, and the London (Royal Free Hospital) School of Medicine for Women. The London School of Tropical Medicine and the Lister Institute of Preventive Medicine are also recognised as schools of the University in special departments. External students are all other matriculated students, and may pursue their studies at other universities and medical schools, presenting themselves for examination at the University.

Faculty of Medicine.—The Faculty of Medicine grants the joint degrees of M.B., B.S. (*Bachelor of Medicine and Surgery*), the higher separate degrees of M.D. (*Doctor of Medicine*) and M.S. (*Master of Surgery*), and the degree of B.D.S. (*Bachelor of Dental Surgery*).

The curriculum for the M.B., B.S. degrees is five and a half years from the time of matriculation, with certain exceptions which must be looked for in the official regulations of the University, to be obtained from the Principal Officer, University of London, South Kensington, S.W. 7.

A. *Internal Students.*—For the Bachelor's degrees in Medicine and Surgery a student must normally, after registration as an internal student, have: (1) *Attended* prescribed courses of study for five and a half years in one or more schools of the University. (2) Passed the following examinations, under the conditions mentioned below: (*a*) The First Examination for Medical Degrees in Inorganic Chemistry, Physics, including Mechanics, and General Biology; (*b*) the Second Examination for Medical Degrees: Part I., Organic Chemistry, including Bio-Chemistry: Part II., Anatomy, Physiology, and Pharmacology; (*c*) the Third Examination for Medical Degrees, or M.B., B.S. Examination in Medicine, Surgery, Obstetrics and Gynæcology, Pathology, Forensic Medicine, and Hygiene.

B. *External Students.*—For the Bachelor's degrees in Medicine and Surgery an external student must (1) have passed the Matriculation examination or have been exempted therefrom under Statute 116 not less than five and a half years previously; (2) have passed subsequent examinations similar to those required of an internal student; and (3) have been engaged in professional studies during the five and a half years subsequently to Matriculation and four and a half years subsequently to passing the First Examination for Medical Degrees at one or more of the medical institutions or schools recognised by this University for the purpose, one year at least of the four and a half years to have been spent in one or more recognised institutions or schools.

The First Examination for Medical Degrees (*Inorganic Chemistry, Physics, including Mechanics, and General Biology*) will take place twice in each year, commencing on the Monday following Dec. 7th and on the first Monday in July. It must be passed not less than nine months after matriculation.

The Second Examination for Medical Degrees (*Part I.*): *Organic Chemistry, including Bio-Chemistry.*—This examination will take place twice in each year, commencing on the Tuesday following the third Monday in March and on the second Monday in July. No candidate will be admitted to this examination until he has completed the First Examination.

The Second Examination for Medical Degrees (*Part II.*) takes place twice in every year, commencing on the Tuesday following the third Monday in March and on the Tuesday following the first Monday in July. No candidate shall be admitted to the examination unless he has passed the First Examination for Medical Degrees at least 18 months previously, and has passed Part I. of the Second Examination for Medical Degrees.

The Third or M.B., B.S. Examination.—The M.B., B.S. examination takes place twice in each year, commencing on the fourth Monday in October and on the first Monday in May. No candidate will be admitted to this examination unless he has completed the Second Examination for Medical Degrees, together with a course of study summarised below, nor within three years from the date of passing the Second Examination, Part II., in Anatomy and Physiology. The course of study comprises introductory course in (1) Clinical Medicine; (2) Clinical Surgery; and (3) Clinical Pathology; (4) Experience as Clinical Clerk; (5) Clinical Medicine; (6) (*a*) Fevers, (*b*) Children's Diseases, (*c*) Venereal Diseases, (*d*) Mental Diseases (at a recognised Asylum), (*e*) Dermatology, (*f*) Vaccination, (*g*) Materia Medica and Pharmacy; (7) Experience as a Surgical Dresser; (8) Clinical Surgery; (9) Ophthalmology; (10) Oto-Rhino-Laryngology; (11) (*a*) Operative Surgery, (*b*) Applied Anatomy, (*c*) Administration of Anæsthetics, (*d*) Dental Surgery, (*e*) Orthopædic Surgery; (*f*) Mechano-therapeutics; (12) Obstetrics and Gynæcology; (13) Lying-in-Hospital; (14) The conduct of at least 20 Labours; (15) Ante-natal Clinic; (16) Experience as a

Clinical Clerk in Gynæcological Work; (17) General Pathology, Morbid Anatomy, Bacteriology, and Chemical Pathology; (18) Work in the Post-Mortem Room; (19) Clinical Laboratory; (20) Forensic Medicine; (21) Hygiene. He must have attended the Medical and Surgical Practice of a recognised hospital for two years, and have held the posts of clinical clerk and surgical dresser for periods of six months each. Candidates will be examined in Medicine, Pathology, Forensic Medicine and Hygiene, Surgery, Obstetrics and Gynæcology. The subjects may be divided into two groups—namely: (1) Medicine, Pathology, Forensic Medicine, and Hygiene; and (2) Surgery, Obstetrics, and Gynæcology. These groups may be taken either separately or together. The list of candidates who have passed will be published in two parts—namely, an Honours list and a Pass list. Bachelors of Medicine of this University who graduated in or before May, 1904, may obtain the B.S. degree by passing the Surgical part of the M.B., B.S. examination.

Doctor of Medicine.—The examination for this degree takes place twice in each year, commencing on the first Monday in December and on the first Monday in July. Candidates may present themselves for examination in one of the following branches—namely: (1) Medicine; (2) Pathology; (3) Psychological Medicine; (4) Midwifery and Diseases of Women; (5) State Medicine; and (6) Tropical Medicine. Any candidate for the degree of M.D. (except in branch 5) may transmit to the Registrar a thesis or published work having definite relation to the branch of Medicine in which he is a candidate, and if the thesis be approved by the examiners the candidate may be exempted from a part or from the whole of the written examination in that subject.

Master of Surgery.—The examination for the degree of Master of Surgery takes place twice in each year and commences on the first Monday in December and on the first Monday in July. Candidates may present themselves for examination in one of the following branches: (1) Surgery; (2) Dental Surgery; (3) Ophthalmology; (4) Laryngology, Otology and Rhinology. A thesis may be submitted as for M.D.

Fees.—Matriculation £2 12*s.* 6*d.* for each entry. at provincial examinations an additional local fee is charged. First examination for Medical Degrees: £6 6*s.* for each entry to the entire examination. For re-examination in one subject the fee is £2 2*s.* Second examination, Part I. £3 3*s.*, repeated on each subsequent entry; Part II. £9 9*s.* for the whole examination. Third examination: £12 12*s.* for each entry to the whole examination. M.D. Examination: £21; for re-examination £10 10*s.* M.S. Examination: As for M.D.

Full details of the prescribed curricula of study and the names of the recognised Internal and External Schools of the University, can be obtained free on application to the Principal Officer. University of London, South Kensington, S.W. 7.

MEDICAL SCHOOLS OF THE UNIVERSITY OF LONDON.[1]

ST. BARTHOLOMEW'S HOSPITAL AND COLLEGE.—The hospital contains 757 beds, of which 687 are for patients in the hospital at Smithfield and 70 for convalescent patients at Swanley. It receives over 9000 in-patients annually and its out-patients and casualties amount to more than 75,000 annually. Special departments have been organised for Diseases of Women and Children, the Eye, Ear, Larynx, and Skin, as well as for Orthopædic and Dental Surgery, and for Electro-therapeutics and X Ray work. Surgical operations take place every day, except Saturdays, at 1.30 P.M., and Surgical consultations are held on Thursdays at the same hour. Medical consultations are held on Thursdays at 3.15 P.M. The physicians and surgeons deliver clinical lectures weekly during both the winter and the summer sessions. Clinical lectures on all special subjects are also given. Wholetime Clinical Units under Professors of Medicine and Surgery have been established.

Ten house physicians and ten house surgeons are appointed annually, and are provided with rooms and board by the hospital authorities and receive £80 a year as salary. A resident midwifery assistant, an ophthalmic house surgeon, and a house surgeon for diseases of the throat, nose, and ear are appointed every six months, and are provided with rooms and board, and receive a salary of £80 a year. Three resident administrators of anæsthetics are appointed, the senior for one year at a salary of £150, and two juniors for six months with a salary at the rate of £80 per annum, with board and rooms. An extern midwifery assistant is appointed every three months, and receives a salary of £80 a year. The clinical clerks, the obstetric clerks, the clerks to the medical out-patients, the dressers to the surgical in-patients and to the out-patients, and the dressers in the special departments are chosen from the students. A residential college is attached to the hospital.

New Buildings.—The new buildings comprise residential quarters for the resident staff, casualty, medical, surgical, and special out-patient departments, casualty wards, dispensary, and clinical lecture theatre. There is a chemical laboratory attached to the Medical College as well as a laboratory devoted to instruction in Public Health. A block is devoted to Pathology, and contains the post-mortem room as well as extensive laboratories for bacteriology, clinical pathology, pathological histology, and pathological chemistry. *The Medical School Buildings* include three large lecture theatres, a large dissecting room, a spacious library (containing 14,500 volumes), a well-appointed museum of anatomy, physiology, comparative anatomy, materia medica, botany, and pathological anatomy. The pathological museum is the most complete in the kingdom. There are laboratories for chemistry, physiology, pharmacology, physics, public health, and biology, giving ample accommodation in every department.

Special Classes for the Primary and Final F.R.C.S. are held twice yearly. *Instruction in Preliminary Science* is given to University of London students in chemistry, biology, and physics throughout the year. *Laboratory Instruction for the D.P.H.* is provided during the winter and summer sessions. Facilities for research work are afforded in the Clinical Units and the Laboratories of the pathological and other departments. The recreation ground of 10 acres is at Winchmore Hill for the use of the members of the Students' Union, which all students are expected to join. The Students' Union contains a large reading and smoking room, a committee and writing room, luncheon and dining hall, and a miniature rifle range.

Scholarships given in aid of Medical Study.—At this school various Scholarships, prizes, &c., are given. For five of the Scholarships and the Exhibition—namely, (*a*), (*b*), two Entrance Scholarships of the respective values of £75 and £100; (*c*) Entrance Scholarship in Arts, £100; (*d*) Jeaffreson Exhibition, £50; and (*e*) Shuter Scholarship, £50—a full or University course at St. Bartholomew's Hospital is required. The awards of (*a*) and (*b*) are made after examination in selections from the subjects of Chemistry, Physics, Zoology, Botany, Physiology, and Anatomy; (*c*) and (*d*) are awarded after examination in Latin, Mathematics, and Greek or French or German; (*e*) is awarded after competitive examination among Cambridge Graduates in Anatomy and Physiology. The more important of the other Scholarships and prizes are as follows:—Four Junior Scholarships—(*f*) No. 1, £30, Anatomy and Physiology; (*g*) No. 2, £20, Anatomy and Physiology; (*h*) No. 3, £25, Chemistry, Physics, and Biology; (*i*) No. 4, £15, Chemistry, Physics, and Biology; (*j*) Senior Scholarship, £50, Anatomy, Physiology, and Chemistry; (*k*) Kirkes Scholarship, £30 and medal, Clinical Medicine; (*l*) and (*m*) two Brackenbury Scholarships, £39 each, one in Medicine and one in Surgery; (*n*) Sir G. Burrows Prize, 10 guineas, Pathology; (*o*) Skynner Prize, 13 guineas, Regional and Morbid Anatomy; *p*) Matthews Duncan Medal and Prize, £20, Midwifery and Gynæcology; (*q*) Luther Holden Research Scholarship in Surgery, awarded by election, £105; *r*) Lawrence Research Scholarship and Gold Medal n Pathology, awarded by election, £115; and *s*) Baly Scholarship in Clinical Medicine, £105, awarded by examination.

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[1] For Ancillary Metropolitan Medical Schools see p. 393.

Information may be obtained on application to the Dean to the Medical College: Dr. T. W. Shore. The Warden of the Residential College is Mr. R. M. Vick.

CHARING CROSS HOSPITAL.—The Hospital, to which the School is attached, contains 300 beds. Over 3000 cases pass through its wards each year, and some 24,000 out-patients and casualties are treated. There are special departments for Mental Diseases, Midwifery, Diseases of Women, of Children, of the Skin, Ear, Throat, Nose, and Teeth, for Orthopædic Cases, X Ray work, and for Electrical Examination and Treatment.

Appointments.—In the Medical School Demonstratorships and Assistant Demonstratorships are open to students of the School. Medical, Surgical, and Obstetric Registrars to the Hospital are appointed annually. Six House Physicians, six House Surgeons, and two Resident Obstetric Officers are appointed each year after competitive examination.

Primary and Intermediate Studies.—By an agreement with the University of London the School sends ts Primary and Intermediate Students to receive heir lectures and practical work at King's College, which is situated within four minutes' walk.

Final Studies.—These are taken in the school and hospital, where systematic lectures, demonstrations, and tutorial classes are arranged to cover all the subjects necessary for qualifying examinations. Departments are also available for other final subjects of Materia Medica, Toxicology, and Operative Surgery.

An Institute of Pathology with a whole-time staff of scientific workers and fully equipped Laboratories has been established in the School. Students receive heir training in Preventive Medicine, Pathology, and Bacteriology here, and are encouraged to undertake Research. Special facilities are available for Post-raduate Research and Study.

The course in Ophthalmology is given in the Royal Westminster Ophthalmic Hospital adjoining. Special ectures and demonstrations are arranged for Post-raduates.

The *Museum* contains over 4000 specimens, ncluding a notable collection of over 800 gynæco-ogical specimens, "The Cuthbert Lockyer Collection."

Students' Club.—The social comfort and con-enience of students are met by library, reading, and smoking-rooms, refreshment-room, &c. The Club, which is under the control of a Committee of Students, rovides needful athletic recreation, and includes the Medical Society. An athletic ground, comprising six cres, has recently been acquired and is now in use.

Women Students.—Women students are admitted o the School and Hospital upon the same terms and onditions as men, and after qualification are eligible or resident Hospital appointments.

Fees.—Now under revision.

Further information may be obtained on application o the Dean, Dr. W. J. Fenton, Medical School, haring Cross Hospital, London, W.C.

ST. GEORGE'S HOSPITAL.—This hospital has a service f 436 beds, of which 180 are allotted to surgical, 150 o medical cases, and 100 are at the Convalescent Hospital at Wimbledon. One ward is set apart for iseases Peculiar to Women, and a Maternity Ward f 11 beds has been instituted recently. Children's eds are placed in the women's wards. Two wards re allotted to ophthalmic cases.

Entrance Scholarships and Endowed Prizes of a otal value of £600 are awarded annually; a detailed list is placed below. The entire teaching and laboratories are now devoted to purely clinical subjects, and arrangements have been made with the authorities of King's College for students who enter the first, second, or third year of the curriculum as students of St. George's to carry out the necessary courses of instruction at that College. Students then complete their course, without payment of any entrance fee, in a school entirely devoted to clinical work.

Eight house physicians and eight house surgeons are appointed annually. Special attention is directed to the following paid appointments, among others, which are open to students after they have held house office:—Resident Assistant Physician and Resident Assistant Surgeon, at £350 per annum each; Medical Registrarship at £200 per annum; Surgical Registrarship at £200; Assistant Curatorship of the Museum at £100; Obstetric Assistantship (Resident) at £50; the post of Resident Anæsthetist at £100; the post (2) of Senior Anæsthetists at £50; the posts (2) of Junior Anæsthetists, each at £30. The St. George's Hospital Club, with smoking- and luncheon-rooms on the hospital premises, and an athletic ground at Wimbledon, is an amalgamation of the Hunterian Society, the *Gazette*, and the Rugby football, lawn tennis, boxing, rifle, and golf clubs. Students have the advantage of a library of medical and scientific books which is kept up to date.

Scholarships and Prizes.—At this school two entrance scholarships are given, the money value and the subjects of examination being as follows: (*a*) and (*b*) two University Entrance Scholarships, 90 guineas and £70 respectively, Anatomy and Physiology. This year, in addition to these Scholarships, Exhibitions, each of the value of £40 and up to eight in number, will be awarded to candidates of approved merit in the Entrance Scholarships Examination. The others are as follows: (*c*) William Brown Exhibition, tenable for two years and open to perpetual pupils having registrable qualifications, £135 per annum, Practice of Medicine, Midwifery, and Surgery; (*d*) William Brown Exhibition, tenable for three years and open to perpetual pupils qualified not more than three years previously, £49 per annum, Essay and Original Work; (*e*) Allingham Scholarship in Surgery for Students qualified not more than three years, £60, Competitive Essay; (*f*) and (*g*) two Brackenbury Prizes, one in Medicine and one in Surgery, £30 each, open to students of not more than five years' standing; (*h*) H. C. Johnson Memorial Prize, £19, Practical Anatomy; (*i*) Pollock Prize, £23, Physiology, Physiological Chemistry, and Histology; (*j*) Clarke Prize, £5; (*k*) Thompson Medal, £5, Clinical Reports; (*l*) Brodie Prize, £7, Clinical Reports; (*m*) Webb Prize, open to perpetual pupils, £30, Bacteriology; (*n*) Sir Francis Laking Memorial Prize £65, open to students having registrable qualifications.

Further information may be obtained from the Dean of the Medical School, Dr. J. A. Torrens.

GUY'S HOSPITAL.—This hospital, founded by Thomas Guy in 1721 for the reception of 400 patients, and enlarged through the aid of a large bequest from the late William Hunt, contains at the present time 626 beds. The whole of the medical school has been rebuilt during the last 27 years. It provides ample accommodation, with modern equipment, for all the non-clinical subjects of the medical curriculum. Within the grounds of the hospital are situated the residential college, with accommodation for 35 students, the students' club, with reading, smoking, luncheon, and dining-rooms, a fives court, and swimming bath. The athletic ground and club house is situated at Honor Oak Park, and can be reached in 20 minutes from the hospital.

House physicians, house surgeons, out-patient officers and assistant house surgeons, obstetric residents, ophthalmic house surgeons, clinical assistants, clerks to anæsthetists, surgeons' dressers, medical clinical clerks, post-mortem clerks, extern obstetric dressers, and dressers and clerks in the special departments are appointed from among the students upon the recommendation of the Medical Council according to merit. There is a Venereal Clinic, in accordance with the Scheme of the Local Government Board and London County Council. Lectures and clinical instruction are given, to which Medical Students and Practitioners are admitted without fee.

The following new Clinics have been opened: Salomon's Welfare Centre (for Maternity and Children), Tuberculosis Department, and V.D. Department.

Scholarships. — Six entrance scholarships are awarded annually as follows :—(*a*) one War Memorial scholarship, providing a free Medical Education for five years of the value of £200, to be awarded alternately in Arts and Science (next award, July, 1924, Science); (*b*) one Arts scholarship of £100 for students under 21 years of age, Latin, English, Greek, or French or German, Arithmetic, Euclid, and Algebra; (*c*) one Science scholarship for students under 21 years, £100; subjects, any two of the following: Inorganic Chemistry, Physics, and Biology; (*d*) a Junior Science scholarship of the value of £100 is offered for competition, annually in July, to candidates who have attended Preliminary Science Classes at this School; (*e*) two open Science scholarships: (1) a War Memorial scholarship of the value of £80, awarded annually in September; (2) an open scholarship of the value of £80, awarded annually in September, for students under 25 years of age who have completed the curriculum for, or passed the examination in, Anatomy and Physiology for a medical degree in any University of the British Empire, and have not entered as students in any Metropolitan Medical School; subjects, any two of the following: Anatomy, Physiology, Organic Chemistry, Pharmacology, General Pathology.

In agreement with the practice of the Universities, an allowance will be made (1) for Military Service performed by candidates, the term " military service " meaning service in the Naval or Military Forces of His Majesty or of His Majesty's Allies during the war; or (2) in respect of other approved duties in connexion with national defence.

The Dean of the Medical School is Professor T. B. Johnston, from whom further information may be obtained.

UNIVERSITY OF LONDON: KING'S COLLEGE.—The medical department (Faculty of Medical Science) at this College only deals with Preliminary and Intermediate subjects, and instruction in these subjects is given in the College laboratories by university professors and their assistants to students entering the College directly and also to students of the following four hospital schools which prepare only for the final examinations—viz., King's College Hospital, Westminster Hospital, St. George's Hospital, and Charing Cross Hospital. The department is open to both men and women.

Scholarships.—(*a*) Two Warneford Entrance Scholarships of £30 each for four years. Examination in July, subjects selected from Divinity, Classics, Science. (*b*) Sambrooke Scholarship of £25 for two years. Examination in May, subjects selected from Mathematics, Physics, Chemistry, Botany, Zoology, and Geology. (*c*) Worsley Scholarships: £100 in five annual instalments of £20. (*d*) Rabbeth Scholarship of £20 for best work in first year. (*e*) Second Year Scholarship of £20 tenable for one year. (*f*) Daniell Scholarship of £40 for one year. Awarded on results of University Honours Examination.

Fees.—Tuition fee of 35 guineas for the first year, £42 for the second and third years, with a materials fee of 4 guineas in the first year, 6 guineas in the second year, 4 guineas in the third year. For prospectus and further information application should be made to the Dean of the Medical Faculty (Professor E. Barclay-Smith).

Dental Course.—The College, in association with King's College Hospital, have instituted a Dental Diploma Course.

Fees.—First year (Chemistry and Physics), 20 guineas; second and third years (Anatomy, Physiology, Dental Mechanics, and Dental Metallurgy), 52 guineas per annum. Fourth and fifth years (Hospital), 60 guineas per annum. For prospectus and further information application should be made to the Secretary, King's College Hospital Medical School, Denmark Hill, S.E.

KING'S COLLEGE HOSPITAL MEDICAL SCHOOL.—The advanced subjects in the curriculum are taught at the Medical School attached to King's College Hospital, which is situated at Denmark Hill, S.E. 5. The hospital stands in the midst of a South London population, from which an immense amount of clinical material is forthcoming. During the past year there were 198,456 attendances in the out-patient and casualty departments. There are 400 beds available for in-patients, and provision will ultimately be made for 600 beds. There are special departments for Bacteriology, Children, Clinical Pathology, Dermatology, Gynæcology and Obstetrics, Laryngology, Massage, Neurology, Odontology, Ophthalmology, Orthopædics, Otology, Physicotherapy, Psychological Medicine, Radiology, Rhinology, and Urology, each in charge of a specialist and his staff. Clinics are also held in applied pharmacology, cardiology, and medical chemistry. The appointments open to students are those of clinical assistant to the special departments; medical, surgical, obstetric, and pathological tutorships; resident casualty officers: resident anæsthetist; bacteriologist; clinical pathologist; pathological registrar; and medical, surgical, and obstetric registrarships. Fourteen resident medical and surgical officers are appointed half-yearly.

Scholarships and Prizes.—(*a*) Warneford Scholarships, (*b*) Sambrooke Scholarship, (*c*) Rabbeth Scholarship, £20 (see above); (*d*) Medical Entrance Scholarships, £50 (Anatomy and Physiology), and £50 (Pathology and Pharmacology) open to students who (1) propose to take a degree at any British University, and have passed their University examination in Biology, Chemistry, and Physics, and who (2) will become students at King's College Hospital from date of entering upon Scholarship; (*e*) A Medical Entrance Scholarship in Science, value £50, tenable for five years, successful candidates to study at King's College and King's College Hospital; (*f*) Three Medical Scholarships, £40 for fifth-year students, £20 for third-year students, and £20 for second-year students; (*g*) Three Sambrooke Registrarships, open to matriculated students who have filled certain appointments in hospital; (*h*) Carter Prize, £15, Botany; (*i*) Tanner Prize, £10, Obstetrics and Diseases of Women; (*j*) Todd Prize, £4 4*s*. and medal, Clinical Medicine; (*k*) Two Burney Yeo Entrance Scholarships, £80 each, open to students of Oxford and Cambridge on the nomination of the Regius Professors; (*l*) an Epsom College Scholarship, value £50, offered annually to a student of Epsom College who has taken the first part of the courses for Medical Degrees at the Universities of Oxford, Cambridge, or London. The Warneford and Sambrooke Scholars are required to take the subjects of the preliminary and Intermediate examinations at King's College, and the final subjects at King's College Hospital.

Athletics.—The King's College Hospital Clubs and Societies Union was formed in 1908, and consists of the Listerian and Musical Societies, the Students' Common Rooms, and the various athletic and sports clubs. Admirable playing fields, over six acres in extent, have been provided for the use of the students on Dog Kennel Hill, Lordship-lane, S.E., about ten minutes' walk from the hospital. There are also Tennis Courts in the grounds of the Hospital and of " The Platanes "—a hall of residence available for students belonging to the hospital.

Fees.—The composition fee for Hospital work and Final subjects of the curriculum is 93 guineas if paid in one sum, or 95 guineas if paid in two instalments, in addition to the Entrance Fee of 10 guineas. The Calendar of the School will be sent on application to either of the following: Dr. H. Willoughby Lyle, *Dean*; Mr. S. C. Ranner, *Secretary of the Medical School*, King's College Hospital, Denmark Hill, S.E. 5.

LONDON HOSPITAL.—The hospital, with its Medical College and Dental School, is situated in the Mile End-road, E. The hospital contains 950 beds, which are in constant use, and is the only general hospital for East London. During last year 17,444 in-patients and 107,455 out-patients received treatment, while 215 major operations were performed. 32,427 out-patients attended the special departments for diseases of the Eye, Ear, Nose and Throat, Skin, Teeth, &c., and the Orthopædic, Venereal, Radiological, Electro- and Physico-Therapeutical and Inoculation Departments. The hospital presents, therefore, a large field for clinical instruction, and in its Wards and Out-patient Departments exceptional opportunities are afforded for acquiring an extensive and practical experience in all phases of disease.

The Clinical Units in Medicine and Surgery coördinate the teaching of their subjects in the Hospital. The directors and their assistants give practical instruction in Elementary Clinical Medicine and Surgery to all students before they are allowed to enter the Wards and Out-Patient Department. Senior Students are encouraged to work with the units. Special courses of lectures and demonstrations are arranged in Medicine and Surgery and their ancillary subjects. Opportunities for research will be provided under the supervision of the staffs of the units.

Owing to the large number of patients more appointments are open to students before and after qualification than at any other hospital. Holders of resident appointments have free board. Special classes are held for the examinations of the University of London, or the Fellowship of the Royal College of Surgeons, or the Membership of the Royal College of Physicians, and for other higher examinations. A course of post-graduate training is held in the work of School Clinics for School Medical Officers (actual and ntending) and others. Special entries for medical nd surgical practice can be made. A residential Hostel on hospital grounds is provided for the convenience of students. The Clubs Union Athletic Ground of over 13 acres is within easy reach of the hospital.

Scholarships and Prizes.—At this school the uccessful candidates for the first items in the list here hown must enter for the course subsequent to passing the examination in Biology, Chemistry, and Physics. The value and the subjects of examination are as follows:—Price Scholarship £100, and one Entrance Scholarship of £50, subjects of First Medical Examination at the University of London; Epsom College Scholarship, free education, subjects of First Medical Examination as above; Price Scholarhip, open to students of Oxford and Cambridge Universities, £52 10*s*., Human Anatomy and Physiology; Buxton Prize, £31 10*s*., subjects f Anatomy and Physiology; three Prizes for Clinical Work, £20 each, Medicine, Surgery, and Obstetrics and Gynæcology; Sutton Prize, £20, Pathology; Duckworth Nelson Prize, biennial, £10, Practical Medicine, and Surgery; Letheby Prizes (2), 25, Chemistry and Chemical Pathology; eight Dressers' Prizes, amounting to £40, zeal, efficiency, nd knowledge of Elementary Clinical and Minor Surgery; Hutchinson Prize, triennial, £40, Clinical Surgery; two Practical Anatomy Prizes, £6 and £4 espectively; Andrew Clark Prize, biennial, £26, Clinical Medicine and Pathology; James Anderson Prizes (4), £20, Elementary Clinical Medicine; Arnold Thompson Prize, £15, Medical and Surgical Diseases of Children; and Liddle Prize, triennial, 120.

Medical Research Funds.—Research Funds of over 26,000, including the Eliza Ann Alston Endowment Fund for Medical Research, provide valuable scholarships for men wishing to undertake research or desirous of preparing Theses for University degrees.

Dean: Professor William Wright, London Hospital Medical College, E.

ST. MARY'S HOSPITAL MEDICAL SCHOOL.—The Hospital and Medical School are situated close to Paddington station (G.W.R.) having on one side a poor district of 500,000 persons, and on the other side the residential district of Kensington and Bayswater. The hospital contains 305 beds and, by a scheme of affiliation, for teaching purposes, of the Paddington Infirmary, Paddington Green Children's Hospital, and Maida Vale Hospital for Nervous Diseases, the teaching facilities extend over 1000 beds. The Athletic ground (10 acres) is situated at Wembley and can be reached in 30 minutes by a constant service of trains. A large pavilion has recently been added.

Clinical Facilities.—Clinical Units in Medicine and Surgery were established in 1920, and have now been formally recognised by the University Grants Committee. St. Mary's being one of the six Medical Schools in London which enjoy this privilege. Lying-in beds have recently been added, and, in addition to this, arrangements have been made by which all students take out a short course of instruction in Practical Midwifery at Queen Charlotte's Hospital without additional fee.

Institute of Pathology and Research.—Students specially interested in Pathology and Bacteriology have singular advantages at St. Mary's. The institute comprises seven special departments, the whole being under the personal direction of Sir Almroth Wright, F.R.S.

Appointments.—Three Research Scholarships of £200 each are awarded annually to students working in the departments of the institute; and preparation is being made to open 13 research beds. Clerkships in Pathology, Bacteriology, and Chemical Pathology, lasting for a period of three months, are open to students of the fifth year, and enable them to carry out the Pathological and Bacteriological investigations of the wards, and learn the necessary technique under supervision. Seventy-two of these posts are available annually.

Complete Curriculum.—The Medical School provides complete courses of instruction, and students can join at once on passing a Preliminary Examination in Arts. Terms begin in October, January, and April.

Entrance Scholarships.—Three Entrance Scholarships of the value of £210 each are awarded annually.

Fees.—Composition Fee for entire curriculum (5½ years) £200 in one sum, or £210 by four annual instalments. Composition Fee for Clinical curriculum (2½ years) 90 guineas in one sum, or 95 guineas by two annual instalments. As an alternative, students may pay an annual fee of 40 guineas with an entrance fee of 10 guineas.

MIDDLESEX HOSPITAL.—The hospital contains over 450 beds, with special wards for Cancer, Maternity and Gynæcological and Ophthalmological cases, and for Diseases of Children. Other special departments include those for Diseases of the Eye, Ear, Nose and Throat, and Skin; Nervous diseases, Orthopædic cases, Diseases of the Rectum and Venereal Diseases. There is also an Electro-Therapeutic department. The Cancer Charity, containing 92 beds and Special Investigation Laboratories, offers unrivalled opportunities for the study of Cancer, both in its clinical and pathological aspects. In the Electro-Therapeutic Department, students obtain instruction in the Treatment of Lupus and Cancer by the X ray method of treatment.

The Medical School, which now includes the Bland-Sutton Institute of Pathology and the Cancer Research Laboratories is fully equipped for the theoretical and practical teaching of all the subjects of the medical curriculum, and for the Diplomas in Public Health, for which two courses are held yearly, commencing in April and October. Ample laboratory and class-room accommodation is provided. The teaching staff includes 6 Professors, 29 recognised Teachers, 8 Demonstrators, 4 tutors. The Bland-Sutton Institute of Pathology is completely equipped for routine hospital investigations, teaching and research work, and contains a new lecture theatre and large pathological, bacteriological, and clinical laboratories, also smaller laboratories for individual research work. A well-equipped Anatomical and Pathological Museum and Reference Library offer every facility for study.

Other features of interest are: the institution of a course in Medical Radiology and Electrology, under the direction of the "Joel" Professor of Physics; D.P.H. course, under the direction of Dr. Charles Porter, M.O.H., St. Marylebone. Primary F.R.C.S. class will resume in August.

Special classes are held to prepare students for the Intermediate Examinations of the Universities.

Hospital Appointments.—All appointments are made without fee of any kind, and the following are appointed at intervals annually: six house physicians, eight house surgeons, two obstetric and gynæcological house surgeons, two casualty medical officers, two casualty surgical officers, one resident anæsthetist, and two resident officers to the special departments. The medical and surgical casualty officers are appointed twice a year. The medical, surgical, and obstetric and gynæcological registrars are appointed as vacancies arise. Non-resident qualified clinical assistants are appointed to assist in the various out-patient departments. Clinical clerks and surgical dressers are also appointed in every department. Eight Registrars are appointed annually.

Scholarships, Prizes, &c.—(*a*), (*b*), and (*c*). Three Entrance Scholarships, value £100, £50, and £25, and (*d*) a University Scholarship, value £50, are awarded annually in September. The successful candidates are required to become general students of the school. (*e*) A Freer Lucas Scholarship for Foundationers or Council Exhibitioners of Epsom College is awarded annually on the nomination of the Headmaster. There are also, (*f*) and (*g*), two Broderip Scholarships, value £60 and £40 respectively; (*h*) the Lyell Gold Medal and Scholarship, value £55 5*s.*; (*i*) the John Murray Medal and Scholarship, value £25 (awarded every third year); (*k*) the Freeman Scholarship, value £30; (*l*) the Hetley Clinical Prize, value £25; (*m*) the Leopold Hudson Prize, value 11 guineas; and (*n*) the Second Year's Exhibition, value 10 guineas. There are also numerous class prize examinations.

Fees.—The fees are arranged on a basis of an annual payment of approximately £42 for the five years of the curriculum. After five years, if the student is not qualified, the annual fee is £21.

The Amalgamated Students' Club includes the following: the Medical Society, the Common Room Society, Musical Society, the cricket club, the football clubs, the athletic club, the rowing club, the musical society, the chess club, the lawn tennis club, and the hockey club. There are a restaurant and gymnasium in the school buildings, and large athletic grounds at Wembley, with new pavilion. A subscription to the Amalgamated Students' Club is payable by all General and Dental students. Full particulars on application to the Dean, Middlesex Hospital Medical School, W. 1.

St. Thomas's Hospital.—This Hospital received its present charter from King Edward VI., but as a monastic institution was in existence prior to the year 1207. The building occupies a unique position by the river, opposite the Houses of Parliament, and contains 632 beds. The in-patients last year numbered 8639, whilst the number of attendances as out-patients, including the casualty and light departments, was 466,951. There are special departments for the treatment of women, children, the eye, ear, nose and throat, skin, teeth, and for orthopædics. The Tuberculosis Department forms a part of the Lambeth scheme for treatment of patients and for instruction. The Venereal Department has been established as part of the London County Council scheme. Departments for light treatment, X rays, and the Physico-therapeutics are also special features. A speech clinic has been inaugurated in connexion with the Children's Department. Exceptional facilities are offered in the hospital laboratories for the study of General Pathology, Clinical Pathology, Chemical Pathology, and of Treatment by Serums and Vaccines. Surgical operations take place in the main theatres every day, except Saturdays, at 2 P.M. Clinical teaching in the wards, out-patients' and special departments, is available every day of the week. Clinical lectures are delivered every Wednesday during the sessions. All appointments in the hospital are open to students without extra fee. Appointments open to students before qualification: Clinical clerks and dressers for in- and out-patients are selected from students who have completed their third years' work. Every student acts as clerk in the post-mortem room and in one of the pathological laboratories, takes his turn on maternity duty under proper supervision in the maternity ward thus obviating any necessity for seeking instruction elsewhere. Students are instructed in the administration of anæsthetics by the hospital anæsthetists. The Students' Club comprises a spacious restaurant and smoking and reading room. There is no occasion for students to leave the hospital buildings during working hours. The curriculum is arranged to meet the requirements of all the Examining Bodies. Special classes are held for the examinations at the University of London and for the First and Final Fellowship Examinations of the Royal College of Surgeons of England. Tutorial classes in all subjects precede the various examinations. The hospital is easily accessible from all parts.

Appointments Open to Students after Qualification.—A Resident Assistant Physician, a Resident Assistant Surgeon, and a Resident Anæsthetist are appointed annually at a salary of £200 each per annum. Two Hospital Registrars, Medical and Surgical, at an annual salary of £250 each are appointed yearly. The tenure of these offices may be renewed for a term not exceeding two years. An Obstetric Tutor and Registrar, an Ophthalmic Registrar (at an annual salary of £50 each), and an Orthopædic Registrar (unpaid) are appointed yearly. Ten Resident Casualty Officers and Anæsthetists (including two Senior) are appointed every six months. Seven House Physicians (including two Obstetric House Physicians, and one House Physician to the Department of Diseases of Children), nine House Surgeons (including two Ophthalmic House Surgeons, one Orthopædic House Surgeon, and two House Surgeons to the Ear, Nose and Throat Department) are appointed every six months. Eight Clinical Assistants in the Special Departments are appointed every three months, and hold office for six months if recommended for re-election. There are three Assistants in the Department of Pathology; the Senior receives £600 a year, and the two Juniors £450 each.

Fees.—The annual fees are: For each year of study £50. These fees cover all tutorial classes, but do not include instruction in infectious fevers, pharmacy, and vaccination. Qualified practitioners are permitted to attend the hospital practice on terms which may be ascertained from the Medical Secretary.

Scholarships and Prizes.—At this school there are five Entrance Scholarships—namely, two in Arts, equivalent to the tuition fees for the first year of study; two in Natural Science, of the value of £150 and £60 respectively; and the University Scholarship of £100 in any two of the following subjects: Anatomy, Physiology, and Chemistry. The value of all entrance scholarships must be taken out in tuition fees. The money value and subjects of examination of the remainder are as follows: (*a*) William Tite Scholarship for second-year students, £25; (*b*) and (*c*) Musgrove Scholarship or (alternately) Peacock Scholarship, each for third-year students and tenable for two years, £35 each; (*d*) Cheselden Medal, Surgery and Anatomy; (*e*) Mead Medal, Medicine, Pathology, and Hygiene; (*f*) Toller Prize, Medicine, Pathology, and Hygiene; (*g*) Bristowe Medal, Pathology, and Morbid Anatomy; (*h*) Solly Medal and Prize, biennially, Surgical Reports; (*i*) Cutton Memorial Medal in Clinical Surgery, iennial ; (*j*) Wainwright Prize, Medicine, Pathology, nd Hygiene ; (*k*) Hadden Prize, Pathology ; (*l*) Beaney Scholarship, £50 biennially, Surgery and Surgical Pathology ; (*m*) Sutton Sams Prize, bienially, reports of cases in Obstetric Medicine ; (*n*) Grainger Testimonial Prize, £31 10*s.* Anatomy and Physiology ; (*o*) Louis Jenner Research Scholarship, enable for two years, £60 annually, Pathology ; and p) Research Scholarship, tenable for two years, £200 er annum.

The Dean of the Medical School is Sir Cuthbert S. Vallace, and the Medical Secretary Dr. A. Elliot, rom whom any further information may be obtained.

UNIVERSITY OF LONDON, UNIVERSITY COLLEGE.—Jniversity College has been constituted a University entre for the teaching of medical sciences. The College Faculty of Medical Sciences comprises the Departments f Physics, Chemistry, Botany, and Zoology (the Preliminary Medical Sciences) ; also the Departments f Anatomy, Physiology and Pharmacology (the Internediate Medical Sciences), and the Department of Hygiene and Public Health. Research work is underaken in all departments. The completion of the nstitute of Medical Sciences, which the generosity f the Rockefeller Foundation made possible, provides xceptional facilities for research and post-graduate tudy in anatomy, physiology and pharmacology. In articular might be specified the opportunities for nvestigation in human and comparative embryology nd neurology, in histology, radiology, anthropology, iochemistry, and experimental physiology and xperimental embryology. Arrangements have also een made for the closer correlation of work in the nstitute with that of University College Hospital and s Medical School.

Faculty of Medical Sciences.—Composition Fees.—For the courses required by the University of London. . For the First Medical Course, 35 guineas, entitling o one attendance and to the privileges of the Union ociety for one session. 2. For the Second Medical Intermediate) Course 80 guineas, payable in two nstalments of 40 guineas each. This fee entitles to ttendance at Anatomy and Physiology during three ears and to one attendance at Organic and Applied hemistry, Pharmacology, and Materia Medica, and o the privileges of the Union Society or the Women's nion Society for two sessions.

For the medical education required by the Examining oard in England and the Society of Apothecaries. irst examination, Parts I., II., III., 29 guineas, ntitling to attendance for the First and Second Terms nd to the privileges of the Union Society for one ession ; 35 guineas, entitling to attendance throughout ne session and to the privileges of the Union Society r one session. First Examination, Part IV., and econd examination, 80 guineas, payable in two instalents of 40 guineas each. This fee entitles to attenance during three years in all subjects but Practical harmacy and to the privileges of the Union Society r two sessions.

Scholarships and Prizes.—The first three items on ne present list require a complete intermediate course University College. The money value and subjects examinations are as follows : (*a*) The Bucknill cholarship, 135 guineas ; (*b*) and (*c*) two Entrance xhibitions, 55 guineas each, Chemistry, Physics, otany, and Zoology ; (*d*) Cluff Memorial Prize, £15 ennially, Anatomy, Physiology, and Chemistry ;) Schafer Prize in Physiology, £18 triennially ;) Sharpey Physiological Scholarship, £105, Biological ciences ; (*g*) Morris Bursary for sons of deceased rofessional men, by nomination, tenable for two ears, £16 a year ; and (*h*) five Gold and five Silver edals awarded annually in various departments.

Women students are admitted.

UNIVERSITY COLLEGE HOSPITAL MEDICAL SCHOOL. -Dean : Sir George Blacker. Vice-Dean : Mr. Gwynne Villiams. Secretary : Mr. G. E. Adams. Open to en and a limited number of women students. Fees for Preliminary and Intermediate Course : See under University College. For the Final M.B., B.S. (London) Course, 112 guineas if paid in one sum, 115 guineas if paid in two instalments, as follows—first year, 70 guineas ; second year, 45 guineas. This fee entitles to attendance on lectures and hospital Practice during three years and to one attendance on Practical Pathology and Practical Surgery. Vaccination and attendance at a Fever Hospital are not included. This course of instruction is also suitable for the corresponding examinations at the Universities of Oxford, Cambridge, Durham, and other British Universities, and for the medical education required by the Examining Board in England and the Society of Apothecaries. There are over 300 beds in the hospital.

Clinical Units in Medicine and Surgery are now in operation. The whole-time Directors of the Units are concerned with the organisation of the teaching generally, but the honorary staff are responsible for the largest share of the teaching in the wards and Outpatient Department of the hospital. A Unit in Obstetric Medicine will be established as soon as the new Obstetric Hospital now in course of construction is finished.

The new buildings of the Obstetric Hospital of 60 beds (rendered possible by the Rockefeller Benefaction), the new Residents' House (with accommodation for 30 residents and students), the extension to the Nurses' Home, and the new research laboratories for the Medical School, are well under way, and these buildings should be ready for occupation by the spring of 1924.

Special Departments, Clinical and Laboratory Facilities.—Those who are desirous of carrying out original research in Pathology, including Morbid Anatomy, Bacteriology, Experimental Pathology, and Chemical Pathology, are admitted to work in the laboratories of the school by the Professor of Pathology, and under certain conditions can receive grants from the Charles Graham Medical Research Fund. A special course of instruction is given in conjunction with University College for preparation for the examinations for Diplomas in Public Health of the various universities and examining bodies. In the Dental School in Great Portland-street, formerly known as the National Dental Hospital, there is afforded the opportunity for attending lectures and practical instruction in diseases of the mouth and teeth.

Appointments tenable by Students.—Clerkships and dresserships to the physicians, surgeons, anæsthetist, and pathologist are allotted amongst the students of the hospital. Maternity students are appointed each month and reside in the Students' House connected with the Medical School and Hospital. Twelve house physicians, eight house surgeons, four senior and four junior obstetric assistants (of the total number of resident officers not more than three may be held by women students at any one time) are selected annually by examination from among the senior students who have a medical qualification. The house physicians and house surgeons reside free in the hospital for six months, and the senior obstetric assistants for three months. In addition to these posts there are certain special appointments which are vacant from time to time and are filled by senior students of the hospital : Resident Medical Officer, Surgical Registrar, Obstetric Registrar, Harker-Smith Cancer Registrar, Casualty Medical Officer and a Casualty Surgical Officer, Assistants in Ear and Throat, Ophthalmic, Skin and Venereal Diseases Departments, and House Anæsthetist.

Museum of Pathological Anatomy.—The Museum is open for study from 9 A.M. to 5 P.M. Microscopic sections of most of the specimens in the Museum have been prepared and are available for the use of students on application to the Curator. The Museum contains 1100 admirable paintings by Sir Robert Carswell and Sir Charles Bell and a collection of old surgical instruments formerly belonging to Robert Liston.

The Anatomical Museum of the University of London, University College, is open to all students of

University College Hospital and Medical School on the recommendation of the School Committee.

The Medical Library is open daily for the purposes of study to every student of the Medical School from 9 A.M. to 5 P.M., Saturdays 9 A.M. to 1 P.M. It contains about 13,500 works on medical subjects, including all the current text-books and works of reference required for study or research.

The Medical Society of University College Hospital Medical School exists for the dual purpose (1) of promoting the study of medical and surgical science, and (2) of promoting social intercourse among its members. All male students of the Medical School are required to become members. Meetings are held once a fortnight for the purpose of discussing subjects connected with the study of medicine. In its social aspect the society includes various athletic clubs and superintends the gymnasium and squash racquet court in the Medical School. The Athletic Ground, which is used in conjunction with the Union Society of the University of London University College, is situated near the G.W.R. station at Perivale.

Scholarships and Prizes.—At this School the first two Scholarships (*a*) and (*b*) entitle the holder to a complete course at University College and University College Hospital Medical School; the second two (*c*) and (*d*) entitle to a final course at the Medical School. The money value and subjects of examination are as follows:—(*a*) Entrance Scholarship, Bucknill, 135 guineas, Chemistry, Physics, Botany, and Zoology; (*b*) Epsom Free Medical Scholarship, subjects of Preliminary Scientific Examination and Nomination by Epsom College; (*c*) and (*d*) two Goldsmid Entrance Exhibitions, 112 guineas each, Anatomy and Physiology; (*e*) Graham Scholarship in Pathology, £300 per annum for two years, awarded by the Senate of the University of London; (*f*) Atkinson Morley Scholarship, tenable for three years, £45 per annum, Surgery; (*g*) Atchison Scholarship, tenable for two years, £55 per annum, General Proficiency in Medical Studies; (*h*) Magrath Clinical Scholarship, about £100, Clinical Cases; (*i*) Percival Alleyn Scholarship, about £60, Surgery; (*j*) Filliter Exhibition, £30, Pathology; (*k*) Erichsen Prize, £10 10*s*., Practical Surgery; (*l*) two Senior and two Junior Fellowes Clinical Medals for Clinical Medicine; (*m*) two Liston Gold Medals for Clinical Surgery; (*n*) Alexander Bruce Gold Medal for Pathology and Surgery; and (*o*) Tuke Silver and Bronze Medals for Pathology. (*p*) Radcliffe Crocker Travelling Scholarship for Dermatology. (*q*) Leslie Pearce Gould Travelling Scholarship for Surgery.

Residence of Students.—University College Hall, Ealing, is recognised by the Medical School authorities as a residential hostel. The Students' House in University-street contains large and comfortable rooms. The Maternity Students occupy them on payment of a moderate charge. Gentlemen who desire assistance in their studies should consult the Dean or Lecturers.

Westminster Hospital.—The hospital contains 225 beds and affords relief to upwards of 1600 in-patients and 25,000 out-patients annually. There are separate departments for Diseases of the Eye, Skin, Teeth, Ear, Nose, and Throat, for Orthopædic practice, for Diseases of Women, for Diseases of Children, for Radiography, for Venereal Diseases, and for Massage, Electrical and Light Treatment. The Anatomical, Pathological, and Materia Medica Museums are open to all students of the school.

The usual registrarships and house appointments are open to male and female students.

By a scheme for the concentration of the teaching of the preliminary and intermediate subjects of the curriculum, which has the support of the London University, an arrangement has been made by the Westminster School for the teaching of these subjects at King's College. Students, however, may join the Westminster Medical School as formerly and may compete for Entrance Scholarships as heretofore.

Scholarships and Prizes.—The following Entrance Scholarships are offered for competition: Winter Session: Two Scholarships in Anatomy and Physiology, £70 each. Summer Session: Two Scholarships in Anatomy and Physiology, £70 each. A certain number of Scholarships have been allotted to Universities of England, Wales, and the Colonies, and to Public Schools. These Scholarships are awarded entirely on the nomination of the principal of the university or school. During the period of study the following prizes may be competed for: Sturges Prize in Clinical Medicine, about £6, Notes of Cases; Clinical Surgery Prize, £5, Notes of Cases; Chadwick Prize, £21 in books or instruments—Medicine and Surgery, including Pathology and Applied Anatomy and Physiology; Frederic Bird Medal and Prize, open to Fourth-year Students, £14 in medal and books or instruments—Midwifery, Diseases of Women, Medicine, Pathology, Forensic Medicine and Bacteriology, and Public Health and Toxicology; Abrahams Prize in Clinical Pathology, 5 guineas, a Paper and Tests in Practical Work; Alfred Hughes Memorial Prize, open to Second-year students, about £5 in books or instruments—Anatomy; Huxley Memorial Prize, 3 guineas in books or cash, open to Second-year Students—Physiology; Carter Gold Medal and Prize for Botany, open to Students of not more than three years' attendance, gold medal and books of the joint value of £15; Jelf Medal awarded to Third-year Students; Second-year Scholarship £20, Elementary Anatomy, Physiology, Histology, and Organic Chemistry; Daniell Scholarship, tenable for two years, £20, Chemistry; Rabbeth Scholarship, open to First-year Students, £20; Class Examinations in the Preliminary Scientific Course; and the Sambrooke King's College Scholarship in Science, value £25. Inquiries and requests for Prospectus may be addressed to the Dean, Dr. A. S. Woodwark.

London (Royal Free Hospital) School of Medicine for Women, 8, Hunter-street, Brunswick-square, W.C.—The fee for the medical course for the degrees of the University of London and for the diplomas of the Royal Colleges of England and for other qualifications is £240 in five instalments. This sum includes library and laboratory fees. Arrangements are made for pre-medical courses in Chemistry and Physics, which are included in these fees.

The Royal Free Hospital contains 240 beds. The Hospital also has large Casualty and Out-patient Departments, and Departments for Special Diseases. A new and specially equipped block contains the Obstetrical and Gynæcological Unit which, with the Marlborough Maternity Department, controls 68 beds. A Maternity District is attached to the Unit. Students also attend the in-patient and out-patient practice of the Elizabeth Garrett Anderson Hospital, Cancer Hospital, Hospital for Sick Children, Great Ormond-street, National Hospital for Paralysed and Epileptic, South London Hospital, and Royal London Ophthalmic Hospital.

An agreement has been made under which a certain number of students of the school may attend full clinical courses at St. Mary's Hospital, Paddington (305 beds).

Courses are arranged for the Primary Fellowship Examination of the College of Surgeons; also for dental students in conjunction with the Royal London Dental Hospital, Leicester-square.

Students after qualification can hold the posts of house physicians, house surgeons, obstetric assistants, clinical assistants, assistant anæsthetist, medical, gynæcological, and surgical registrars, and assistant pathologist; and at the Medical School the posts of demonstrators in the departments of Anatomy, Physiology, Pharmacology, Biology, Chemistry, and Physics. Many other resident posts in London and elsewhere are also open to them.

The School buildings have been entirely rebuilt in recent years, and there are spacious, well-equipped laboratories, which afford every facility for efficiency of teaching and practical work in all departments.

There are residential chambers at 8, Hunter-street, 25, Gordon-square, 16, Brunswick-square, 5, Mecklenburgh-square, and 36, Tavistock-square, and the Warden can be consulted on the subject of other residences for students. The Students' Union arranges the social, athletic, and other clubs and societies.

Scholarships and Prizes.—(*a*) Isabel Thorne Scholarship, £30. (*b*) St. Dunstan's Medical Exhibition, £60 a year, tenable for three or five years. (*c*) Mrs. George M. Smith Scholarship, £50 a year, tenable for three or five years and next to be awarded in 1925. (*d*) Bostock Scholarship, tenable for two or four years, and next to be awarded in June, 1927, £90. (*e*) Mabel Sharman-Crawford Scholarship, tenable for four years, £20 a year. (*f*) Sir Owen Roberts Scholarship, £75 a year for four years. (*g*) Mabel Webb Research Scholarship, tenable for one year and renewable, £30, Physiology, Chemistry, or Pathology. (*h*) Fanny Butler Scholarship, tenable for four years; next award in July, 1926, £14 10*s.* (*i*) John Byron Bursary, tenable from two to four years, for students already in the School requiring assistance for the prosecution of their medical studies, application to the Secretary by March 31st; next award in March, 1924, £20. (*k*) Helen Prideaux Prize, awarded every second year to a student who has become qualified during the two years immediately preceding the award, and to be spent in assisting the holder to further study, £40. (*l*) Dr. Edith Pechey Phipson Post-graduate Scholarship of the value of £100, awarded annually in June. It is open to all medical women, preferably coming from India, or going to work in India, for assistance in Post-graduate study. (*m*) Sarah Holborn Scholarship, vale £20 a year for three or five years, awarded every alternate year; next award in 1925. (*n*) Dr. Margaret Todd Scholarship, tenable for four years, £37 10*s.* a year, awarded in alternate years; next award in July, 1925. (*o*) Lieutenant Edmund Lewis and Lieutenant Alan Lewis Memorial Scholarship, tenable for four years, awarded every four years; next award in July, 1924. The Dorothy Chick Gift, £20, is awarded annually for efficiency in Practical Midwifery. Two Richardson-Kuhlmann Prizes are given each year, value £12, for proficiency in Clinical Obstetrics, value £8, for proficiency in senior subjects respectively. Two Evans Prizes of £2 2*s.* and £1 1*s.* are given each year on the results of the class examination in Midwifery. The Evans Prize for Operative Midwifery, value £5 5*s.*, is awarded yearly. The Edith Pechey Phipson Prize in Pharmacology, value £3 3*s.*, is awarded annually. There is also a small loan fund from which assistance can occasionally be given to students and to graduates who specially require pecuniary help. Prizes and Certificates of Honour are awarded in each class at the end of the session.

The Dean of the Medical School is Miss Aldrich-Blake, M.D., M.S.; the Honorary Secretary, Dr. May Thorne; and the Warden and Secretary, Miss L. M. Brooks, to whom inquiries may be addressed.

UNIVERSITY OF DURHAM.

Two Diplomas, one Licence, and seven degrees are conferred—viz., the Diploma in Public Health, Diploma in Psychiatry, the Licence in Dental Surgery, and the degrees of Bachelor of Medicine, Bachelor of Surgery, Doctor of Medicine, Master of Surgery, Doctor of Surgery, Bachelor of Hygiene, and Doctor of Hygiene.

For the degrees of *Bachelor of Medicine* and *Bachelor of Surgery* there are four professional examinations. The subjects of the First Examination are—Elementary Anatomy, Elementary Biology, Chemistry, and Physics. The subjects of the Second Examination are—Anatomy and Physiology. The subjects for the Third Examination are—Materia Medica and Pharmacy, Pharmacology, Medical Jurisprudence, Public Health, and Pathology and Elementary Bacteriology. The subjects of the Fourth Examination are—Medicine, Clinical Medicine and Psychological Medicine, Surgery and Clinical Surgery, Operative Surgery, Midwifery and Gynæcology, Therapeutics, and Diseases of the Skin, of the Throat, Nose, and Ear, and of Children. It is required that at least one of the five years of professional education shall be spent in attendance at the University College of Medicine, Newcastle-upon-Tyne.

For the degrees of *Doctor of Medicine* and *Master of Surgery* a candidate must not be less than 24 years of age. He must also have obtained the degrees of Bachelor of Medicine and Surgery of the University of Durham and must have been engaged for at least two years subsequently to the date of admission to these degrees in research work, or in attendance on the practice of a recognised hospital, or in the naval or military services, or in medical or surgical practice. The candidate for the M.D. degree may present an essay or undergo a special examination in the Theory and Practice of Medicine. The subjects of examination for the M.S. are:—Principles and Practice of Surgery, Surgical Pathology, Surgical Anatomy, Surgical Operations, Clinical Surgery.

Doctor of Medicine (without residence).—The University of Durham has instituted a special examination whereby the degree of Doctor of Medicine may be obtained without residence. Candidates shall not be under 40 years of age and shall have been in active practice for 15 years as registered medical practitioners. They shall produce certificates of moral character from three registered members of the medical profession. The fee will be 50 guineas, of which 20 guineas will be retained if the candidate fails to satisfy the examiners.

Doctor of Surgery.—The University of Durham grants the Degree of Doctor of Surgery. Candidates for this degree must be registered medical practitioners, and not less than 24 years of age. They must devote three years, subsequently to obtaining a registrable qualification, to the study of Surgery and ancillary subjects. One at least of the three years must be spent in the University. The candidate must submit to the Professor of Surgery the course of study he proposes to follow, and this course must be approved by the Board of the Faculty of Medicine. One year shall be devoted mainly to work in the departments of Anatomy, Physiology, Pathology and Bacteriology, and the candidate must submit evidence of having so worked. Not less than six months of another year must be spent as resident surgeon in a recognised teaching hospital, and the rest of the year in the study of surgery in a recognised medical centre. Not less than six months of one of the three years must be spent in surgical study abroad. The fee for the examination is £20, and the fee for the degree is £10.

Candidates for any of the above degrees, diplomas, or licence, must give at least 28 days' notice to Professor Howden, Registrar, College of Medicine, Newcastle-upon-Tyne. In the case of the M.D. (essay) examination candidates must send in their essays before the 1st of April.

Scholarships and Prizes.—In connexion with this University the following Scholarships and prizes are awarded:—(*a*), (*b*), (*c*), and (*d*). Four Scholarships of £25 a year each, tenable for four years; the examination will be the September Matriculation Examination. Candidates must take English, Latin, Arithmetic, Euclid, Algebra, Geography, English History, and one, or two, of the three languages—French, Greek, German. (See College Calendar for special books.) Open to candidates desirous of being admitted as Medical Students. The successful candidates must take out their entire curriculum at the University of Durham College of Medicine, Newcastle-upon-Tyne. (*e*) Pears Scholarship of £50 a year (when vacant), tenable for three years; Matriculation Examination.—At the College of Medicine are: (*f*) Dickinson Scholarship, interest on £400 and gold medal; examination in Medicine, Surgery, Midwifery, and Pathology. Open to full students of the College of Medicine who have passed the third M.B. Examination. (*g*) Tulloch Scholarship, interest on £400; examination in Elementary Anatomy, Biology, Chemistry, and Physics. (*h*) Charlton Memorial Scholarship, interest on £700; examination in Medicine. Open to full students of the College entered for the class on the Principles and Practice of Medicine. (*i*) Gibb Scholarship, interest on £500; awarded annually as a Scholarship in Pathology to full student who passes the best examination in that subject. No student is eligible after completion of his curriculum. (*j*) Luke Armstrong Memorial Scholarship, interest on £680: Original Essay in Comparative Pathology. Open to all Graduates in Medicine or Hygiene and candidates for these degrees who have spent six months at the University and whose age does not exceed 30 years. (*k*) Stephen Scott Scholarship, interest on £1000; Original Essay on any Surgical subject. Open to any graduate in Medicine or Surgery of the University or any student of the College of Medicine. Student's age must not exceed 30 years. (*l*) Heath Scholarship in Surgery, of the value of £200, awarded every second year. All Graduates in Medicine or Surgery of the University are eligible. (*m*) Philipson Scholarships (2). The interest on £1800 to the candidates who obtain the highest marks in the Final M.B., B.S. Examinations held in March and June respectively. (*n*) Gibson Prize, interest on £250 stock; examination in subject of Midwifery and Diseases of Women and Children. Open to students who have attended one course of lectures on Midwifery and Gynæcology. (*o*) Outterson-Wood Prize, interest on £250, in Psychological Medicine. (*p*) Turnbull Prize and Medal; examination in Surface Anatomy. Open to students at end of their second winter session.—At the Royal Infirmary is (*q*) Goyder Memorial Scholarship, interest on £325, awarded annually to student who most distinguishes himself in Clinical Medicine and Clinical Surgery at the Royal Infirmary. For further information apply to Professor R. Howden, Registrar of the College.

The College of Medicine, Newcastle-upon-Tyne.—Clinical instruction is given at the Royal Victoria Infirmary, containing about 550 beds. In it adequate accommodation is provided for the study of the various special subjects, in addition to the ordinary clinical work. Post-graduate classes are held.

The Bacteriological Laboratory.—A new Bacteriological Laboratory has recently been erected adjacent to Armstrong College.

Newcastle-upon-Tyne Royal Victoria Infirmary.—The Infirmary was founded in 1751, but has been entirely rebuilt, the new hospital being opened by His late Majesty King Edward VII. in 1906. The number of beds is 550. The number of in-patients annually is 11,500 and out-patients' attendances 276,000. The medical students of the University of Durham attend the practice of this hospital. Clinical Lectures are delivered by the Physicians and Surgeons weekly and ward demonstrations are given daily. Tutorial classes are held by the Assistant Physicians and Assistant Surgeons, and demonstrations are given in the several out-patient departments daily. Pathological demonstrations are given by the Pathologist daily or as opportunity occurs, and in the new buildings nothing has been spared in perfecting scientific equipment. In addition to medical and surgical in-patient and out-patient departments the following special departments are fully equipped for teaching students: Ophthalmic, Throat, Nose, and Ear, Skin, Gynæcological, and Electrical. The hospital building contains the following laboratories: 1. Special Pathological Laboratory, attached to the post-mortem rooms. 2. Bacteriological Laboratory, in which all clinical bacteriological investigations are carried out—opsonic indices estimated with a view to treatment by vaccines and serums, &c. 3. There is in addition a Clinical Laboratory attached to each ward and to the out-patient department. There are five operating theatres in use in the hospital. The winter session of 1923 opens on Oct. 2nd and the summer session of 1924 on April 15th. Applications for detailed information should be made to the Dean, Dr. Horsley Drummond, at the hospital.

There are other institutions in addition to the Royal Victoria Infirmary at which the student of medicine of the University of Durham can receive clinical instruction. Practical Midwifery can be studied at the Newcastle Lying-in Hospital. Instruction is given in Psychological Medicine at the City of Newcastle Mental Hospital. A special course of instruction is given in the City Hospital for Infectious Diseases by the City Officer of Health. Ophthalmology is further taught at the Northumberland, Durham, and Newcastle Infirmary for Diseases of the Eye.

Post-Graduate Courses.—General and Special Post-Graduate courses are held under the joint auspices of the Council and the College of Medicine, the honorary staff of the Royal Victoria Infirmary, and the British Medical Association.

UNIVERSITY OF BIRMINGHAM.

The University of Birmingham grants the degrees of M.B., Ch.B., M.D., Ch.M., and Ph.D. (for Research Study), and also a degree and a diploma in Public Health. The course for the Bachelors' degrees extends over five years from the date of commencement of professional study. As a rule the first four of these years must be spent in the University, but the Senate has power of recognising attendance at another University as part of the attendance qualifying for these degrees and of recognising examinations passed at such other Universities as exempting from the examinations in Chemistry, Physics, and Elementary Biology. In the case of such students at least three years must be spent in attendance upon classes at the University. The fifth year may be spent at any other medical school recognised by the University.

Degrees of Bachelor of Medicine and Bachelor of Surgery.—The student must have passed the Matriculation Examination of the Joint Board or an examination accepted in lieu thereof, and a recognised Pre-Medical Examination in Chemistry and Physics. All communications respecting the Matriculation Examination, and examinations accepted in lieu thereof, must be sent to the Secretary, Joint Matriculation Board, 315, Oxford-road, Manchester. First Examination.—Part I., Elementary Biology and Organic Chemistry.—Part II., Anatomy and Physiology. Second Examination.—General Pathology and Bacteriology, Materia Medica, and Practical Pharmacy. Third Examination (at the end of the fourth year).—Forensic Medicine, Toxicology, Public Health, Therapeutics, and Special Pathology. Two years' hospital work must have been accomplished. Final Examination.—Medicine, Surgery, Midwifery, Diseases of Women, Mental Diseases, and Ophthalmology. Attendance at a general hospital for a year after the passing of the fourth examination will be required, also attendance at a fever hospital three months, maternity hospital one month, and mental hospital three months. Vaccination instruction must be taken out and courses of Ophthalmology, Venereal Diseases, Skin Diseases, and Diseases of Ear, Nose, and Throat, Medical and Surgical Anatomy, and Operative Surgery.

Degrees of Doctor of Medicine and Master of Surgery.—At the end of one year from the date of having passed the final M.B., Ch.B. examination the candidate will be eligible to present himself for the higher degrees of either Doctor of Medicine or Master of Surgery or both. Candidates have to present a thesis on some subject embraced in the medical curriculum, and pass a general examination in Principles and Practice of Medicine for the M.D., and one in Principles and Practice of Surgery, including operations on the cadaver, for the M.Ch. A thesis of exceptional merit may exempt from any part of these examinations.

Degree of Ph.D.—The Degree of Doctor of Philosophy is conferred upon candidates who possess a medical degree of a British, Colonial, or other university approved of by the Senate of the University, and who have been engaged, to the satisfaction of the Medical Faculty, in advanced study and research for a period of not less than two years, either in a laboratory of the University or in one or more of the hospitals associated with the University. After the first year of the course candidates may carry on research elsewhere, under approved conditions, and on completing the course present an original thesis on the subject and to submit themselves for oral and possibly written examination.

Fees.—Matriculation, £2; First Examination, Part I., £2 10*s.*; First Examination, Part II., £2 10*s.*; Second Examination, £2 10*s.*; Third Examination, £2 10*s.*; Final Examination, £10; M.D. or Ch.M., £12 10s.

At the University of Birmingham the following Scholarships are awarded:—(*a*) Myers Travelling Studentship of £300, tenable for one year, offered in alternate years, awarded by vote of committee to M.B., Ch.B. Birm. candidates, tenable at some University or Hospital in Great Britain or Ireland, or abroad, (*b*) two Ingleby Scholarships of £10 each, awarded to the candidate at Final Examination obtaining highest "first-class" marks in the subjects of Midwifery and Diseases of Women; (*c*) Sydenham Scholarship of £42, tenable for three years, award of Council to orphan sons of medical practitioners; (*d*) Sands Cox Scholarship of £21 per annum during two years, awarded to the candidate, not being more than 19 years of age, taking the highest marks at the Higher School Certificate Examination of the Joint Matriculation Board; (*e*) Dental Scholarship of £37 10*s.*, Open Competitive Examination in subjects learned during apprenticeship; (*f*), (*g*), (*h*), and (*i*) Four Queen's Scholarships of £10 10*s.* each. In the Second and Fourth Examinations the Scholarship is awarded respectively to the student taking the first place and obtaining "first-class" marks. In the Third Examination the Scholarship is awarded to the student obtaining the highest "first-class" marks in Pathology and Bacteriology, provided that such student passes at the same examination in the subjects of Materia Medica and Practical Pharmacy. In the Final Examination the Scholarship is awarded to the candidate taking the first place in the examination—that is, obtaining the greatest aggregate number of marks—provided that in each of the subjects of Medicine, Surgery, and Midwifery he gains not less than 60 per cent. of the total available marks; (*j*) George Henry Marshall Scholarship of £10, awarded annually, for the encouragement of Research Work in Ophthalmology; and (*k*) Russell Memorial Prize, a prize of books, value about £2, awarded annually to the student who, not being of more than six years' standing as a student of the School of Medicine of the University, shall pass the best examination in the subject of Nervous Diseases. The "Arthur Foxwell Memorial Medal" (Gold Medal) is awarded annually to the candidate passing the Final M.B., Ch.B. in June, who obtains the highest marks in Clinical Medicine, provided the marks so gained be not less than 60 per cent. The University Clinical Board awards Gold and Silver Medals on examinations in Medicine, Surgery, and Midwifery, respectively, in the fourth and fifth years (open to all students).

Clinical Instruction.—The medical students of the University receive their clinical instruction by attending the amalgamated practice of the General Hospital and the Queen's Hospital under the direction of the University Clinical Board. The hospitals possess more than 600 beds, treating annually about 9000 in-patients and 70,000 out-patients. The curriculum is adapted in the first place to the University of Birmingham, but it also meets the requirements of the examinations of other licensing bodies. At the General Hospital there are open to the students the following appointments: A surgical registrar, £200 per annum; a resident medical officer, elected annually (£155); a resident surgical officer, elected annually and eligible for re-election for three years (£180); a resident pathologist, elected for six months (£100); three house physicians and four house surgeons hold office for six months, receiving board, residence, and salaries at the rate of £70 a year; two house surgeons to the gynæcological, ophthalmic, and aural departments are elected every six months, receiving board, residence, and a salary of £70 a year; two assistant house surgeons are elected every three months, receiving board, residence, and salaries at the rate of £40 a year, and a resident medical assistant at this hospital, who is not necessarily qualified, is provided with board and residence, and holds office for three months. At the Queen's Hospital there are open to the student the following appointments: Three house physicians, three house surgeons, and one obstetric and ophthalmic house surgeon, who hold office for six months and have salaries at the rate of £70 a year. One casualty house surgeon who holds office for three months at salary at rate of £70 a year. Four non-resident obstetric students who hold office for one month and receive board only on payment of one guinea per week. Thirty-eight other appointments of varying value are at the City Workhouse and Workhouse Infirmary, at the Birmingham General and Branch Dispensaries, at the Birmingham Mental Hospitals, at the City Fever Hospitals, at the Children's Hospital, at the Birmingham and Midland Eye Hospital, at the Orthopædic and Spinal Hospital, at the Maternity Hospital, and at the Ear and Throat Hospital.

Post-graduate Courses.—A Lectureship in Morbid Psychology was established in 1919 in the University, and courses of lectures are given annually by specialists in the subject. The Ingleby Lectures on some subject in connexion with Diseases of Women and Children are given annually by specially appointed lecturers. Post-graduate Courses of Clinical Demonstrations (for General Practitioners) at the Birmingham General and Queen's Hospitals were held from April to June, 1923. Further courses will be arranged later.

BIRMINGHAM GENERAL HOSPITAL.—371 beds are in daily use, 6000 in-patients per annum. Special wards for Children, Gynæcological, Ear and Throat, Venereal, Maternity, Septic and Infectious cases; special beds for Eye and Skin cases. About 50,000 out-patients per annum. Laboratories for Bacteriology and Morbid Histology. Separate rooms adjoin the medical and surgical wards for clinical pathology. Five operating theatres (one for out-patients), all designed and fitted on modern lines. In addition to clinical teaching given in the wards and out-patient department by the honorary staff, medical and surgical tutorial classes are held for senior and junior students. Clinical instruction in all the special departments which include those for Radium, Electro-therapy, Extern Midwifery, and Venereal Diseases. Post-graduate classes are held in every branch of medicine and surgery. The Jaffray Branch Hospital contains 56 beds.

QUEEN'S HOSPITAL (Beds 224).—Similar arrangements for clinical teaching are made here, and the material also is excellent. Ward and tutorial classes and post-graduate courses are regularly conducted by the staff, there are daily clinics in the out-patient department, while teaching duties are definitely assigned to the house physicians and house surgeons. There are also special departments for gynæcology and ophthalmology, dentistry, radiography, pathology, bacteriology, massage, electricity, whirlpool baths, electro-cardiograph, &c.

BIRMINGHAM AND MIDLAND EYE HOSPITAL, Church-street, Birmingham.—This hospital possesses 120 beds, and there is an average daily attendance of out-patients of 250. Students attending for a period of three months will be granted certificates which will qualify for the University and Conjoint Board examinations. Post-graduate courses are available on various subjects when a sufficient number of graduates are present. A limited number of Non-Resident Clinical Assistants posts are available to qualified practitioners, particulars of which can be had on application to the General Superintendent.

UNIVERSITY OF LIVERPOOL.

The degrees in the Faculty of Medicine are Bachelor of Medicine and Bachelor of Surgery (M.B. and Ch.B.), Doctor of Medicine (M.D.), Doctor in Philosophy (Ph.D.), Master of Surgery (Ch.M.), Master of Hygiene (M.H.), and Master of Orthopædic Surgery (M.Ch.Orth.).

Degrees of Bachelor of Medicine and Bachelor of Surgery.—Candidates for the degrees of Bachelor of Medicine and of Surgery must have attained the age of 21 years on the day of graduation. At least two of the five years of medical study must have been passed in the University, and one year at least must have been passed in the University subsequently to the date of passing the First Examination. The other three years may be passed at any college or medical school recognised for this purpose by the University. Candidates must pass three examinations entitled respectively: the First Examination, the Second Examination, and the Final Examination. The fee is £5 for each examination. The subjects of the First Examination are: (1) Chemistry, Inorganic, Organic, and Physical; (2) Biology (Zoology and Botany); and (3) Physics. The examination is divided into two parts—namely, (1) Chemistry and Physics, and (2) Biology; and candidates may present themselves in these parts separately. The subjects of the Second Examination are (*a*) Anatomy and Physiology (including Physiological Chemistry and Histology), and (*b*) Materia Medica and Pharmacy and Pharmacology. Candidates may present themselves in (*a*) or (*b*) separately. The subjects for the Final Examination are: (1) General Pathology, Morbid Anatomy, and Bacteriology; (2) Forensic Medicine, Toxicology, and Public Health; (3) Obstetrics and Diseases of Women; (4) Surgery, Systematic, Clinical, Operative, and Practical, including Ophthalmology; (5) Medicine, Systematic and Clinical, including Mental Diseases and Diseases of Children, and Therapeutics. The Final Examination is divided into three parts, the first consisting of subject (1), the second of subject (2), the third of subjects (3), (4), and (5). Candidates may present themselves in these parts separately. Candidates for the third part must have completed the fifth year of medical study.

Degrees of Doctor of Medicine and Master of Surgery.—No candidate will be admitted to the degree of Doctor of Medicine or Master of Surgery unless he has previously received the Degrees of Bachelor of Medicine and Bachelor of Surgery, and at least two years have elapsed since he passed the examinations for those degrees, or, in the case of the degree of Doctor, unless, having obtained substantially equivalent degrees in an approved University, he has subsequently spent two years in the University or in the Clinical School in the performance of research or the conduct of systematic clinical observations. Candidates for the degree of Doctor of Medicine are required to present either a published thesis together with, if desired, other published work, or an unpublished thesis together with copies of original work published in scientific journals or in the proceedings of scientific societies or otherwise. An examination is required if the work submitted is not of special merit. If the work submitted is of special merit but extremely specialised a candidate may be asked to submit a reasoned report on a subject set by the examiners.

The University has recently established a Diploma in Medical Radiology and Electrology—Part I., Physics; Part II., Radiology and Electrology. The parts may be taken at one examination or separately.

At this University the following Scholarships and Fellowships and Prizes are awarded:—(*a*) and (*b*) Robert Gee Entrance Scholarships, two annually, of £25 each, tenable for two years, Joint Matriculation Board Examination held in July, open to First M.B. Course Students; (*c*) Lyon Jones Scholarship, No. 1, of £21 per annum, tenable for two years, Competitive Examination among Junior Students in First M.B. Subjects, Perpetual Course at the University; (*d*) Lyon Jones Scholarship, No. 2, of £21, Competitive Examination among Senior Students in Anatomy, Physiology, Pharmacology, and Materia Medica; (*e*) Derby Exhibition of £15, Competitive Examination among Fourth- or Fifth-year Students in Clinical Subjects, and Clinical School Exhibition of £15 annually for Fourth- or Fifth-year students; (*f*) University Scholarship of £25 for one year, awarded on results of Second Examination for the degrees; (*g*) Holt Fellowships, Physiology and Pathology, of £100 each, for one year; (*h*) Gee Fellowship, Anatomy, of £100, for one year; (*i*) John Rankin Fellowships in Anatomy, two, each of the value of £120, tenable for two years; (*j*) Johnston Colonial Fellowship, Bio-Chemistry, of £100, for one year; (*k*) John W. Garrett International Fellowship, Bacteriology, of £100, for one year; (*l*) Thelwall Thomas Fellowship, Surgical Pathology, of £150, for one year; (*m*) Ethel Boyce Fellowship in Gynæcological Pathology, of £100, for one year; (*n*) Mary Birrell Davies Memorial Fund Scholarship, of the value of £60, tenable for four years, offered for competition in alternate years; open only to women students who will have attained the age of 19 on the first day of October next following the award; (*o*) Rankin Exhibition in Practical Anatomy, of £25, for one year; Samuels Memorial Scholarships, three at £20; numerous prizes and medals.

Medical School Buildings.—Medical research has also been endowed with several new laboratories in which students can pursue research work after graduation. All the laboratories and class-rooms are situated close together, communicating with one another, and are made up of four large blocks of buildings which form one side of the College quadrangle. There are the Johnston Laboratories for Experimental Medicine and Biochemistry; the Medical School for Anatomy, Surgery, Toxicology, and Ophthalmology; and the Thompson-Yates Laboratories for Physiology and Pathology. A new building for Tropical Medicine has recently been opened.

Clinical Instruction.—The Clinical School of the University consists of four general hospitals—the ROYAL INFIRMARY, the DAVID LEWIS NORTHERN HOSPITAL, the ROYAL SOUTHERN HOSPITAL, and the STANLEY HOSPITAL; and of six special hospitals—the Eye and Ear Infirmary, the Hospital for Women, Liverpool Maternity Hospital and Ladies' Charity, the Royal Liverpool Children's Hospital, St. Paul's Eye Hospital, and St. George's Hospital for Skin Diseases. These hospitals contain in all a total of about 1140 beds. The organisation of these hospitals to form one teaching institution provides the medical student and the medical practitioner with a field for clinical education and study which is unrivalled in extent in the United Kingdom. All the hospitals are within easy access of the University. There are a large number of appointments to house physicianships and surgeonships both at the general and special hospitals which are open to qualified students of the school.

Public Health Department.—This is located in a separate building, in which full courses of instruction are given to students for the Diplomas and Degrees of the University and of other Examining Boards.

Prospectuses and further information may be had on application to the Dean of the Faculty of Medicine, University of Liverpool.

VICTORIA UNIVERSITY OF MANCHESTER.

Four degrees in Medicine and Surgery are conferred by the University—viz., Bachelor of Medicine and Bachelor of Surgery (M.B. and Ch.B.), Doctor of Medicine (M.D.), and Master of Surgery (Ch.M.). A Diploma in Psychological Medicine is awarded by examination to registered medical practitioners.

Degrees of Bachelor of Medicine and Bachelor of Surgery.—Before admission to the degree of M.B. or Ch.B. candidates are required to present certificates that they will have attained the age of 21 years on the day of graduation and that they have pursued the courses of study required by the University Regulations during a period of not less than five and a half years subsequently to the date of their registration by the General Medical Council, two of such years having been passed in the University and one year at least having been passed in the University subsequently to the date of passing the first M.B. Examination. All candidates for the degrees of Bachelor of Medicine and Bachelor of Surgery are required to satisfy the examiners in the several subjects of the following examinations. (These are now under revision.)

The First Examination.—(1) Chemistry and Physics; (2) Biology. Candidates must have attended during at least one year courses both of lectures and of laboratory work in each of the above-named subjects. The Examination is divided into two parts: Part 1, Inorganic and Elementary Organic Chemistry and Physics; Part 2, Biology. The candidates may pass in these parts separately under certain conditions.

The Second Examination. — (1) Anatomy and Histology; (2) Physiology, including Physiological Chemistry. Candidates may pass in (1) and (2) separately under certain conditions.

The Third Examination.—(1) Pathology; (2) Pharmacology and Therapeutics. These subjects may be taken separately under certain conditions.

The Final Examination.—(1) Medicine, Systematic and Clinical (including Mental Diseases and Diseases of Children); (2) Surgery, Systematic, Clinical, and Practical; (3) Obstetrics and Gynæcology (including Clinical and Practical); (4) Forensic Medicine (including an Oral Examination); (5) Hygiene and Preventive Medicine. The Final Examination is divided into two parts.

Candidates for the Second Part of the Final Examination must have completed the sixth year of medical study.

Degree of Doctor of Medicine.—Candidates are not eligible for the degree of Doctor of Medicine unless they have previously received the degrees of Bachelor of Medicine and Bachelor of Surgery and at least one year has elapsed since they passed the examination for those degrees. Candidates may elect either (1) to present an original dissertation; or (2) to undergo an examination. The dissertation must embody the results of personal observation or original research, either in some department of medicine or of some science directly relative to medicine. The examination, which will be written and practical, is in the Principles and Practice of Medicine, in Pathology, and in some other subject to be selected by the candidate.

Degree of Master of Surgery.—Candidates are not eligible for the degree of Master of Surgery unless they have previously received the degrees of Bachelor of Medicine and Bachelor of Surgery and at least one year has elapsed since they passed the examination for those degrees. The degree is conferred in the following branches: Surgery (Branch I.), Gynæcology (Branch II.), Ophthalmology (Branch III.), Laryngology, Otology, and Rhinology (Branch IV.).

Scholarships, Fellowships, and Prizes.—At this University there are 22 Foundation Scholarships, 12 Exhibitions, five being for subjects connected with medical study, a Surgical Prize, a University Fellowship (Leech Fellowship, £100), Research Fellowships in Public Health, and Honorary Research Fellowships. 13 Entrance Scholarships are tenable for Medical courses; one Scholarship is offered in Surgery, Biology, Physiology, and Diseases of Children respectively, and one General Medical and Surgical. Exhibitions are offered in Physiology and Anatomy, and one for French and German. "The Dumville" Surgical Prize is awarded on the results of the Final Examination in Surgery in the Summer Term, £15. The Leech Fellowship (£100) is for the encouragement of study and research, and is open to persons who have graduated M.B., Ch.B., in the University not more than 18 months previously. The Honorary Research Fellowships, tenable for two years, conferring the right of free use of the laboratories, are awarded generally in October on application, with evidence of capacity for independent investigation.

There are many entrance scholarships, the examinations for which are held in the month of May. Full particulars can be obtained from the Registrar.

The Medical School.—This school, largely extended in 1920, is provided with dissecting-rooms, X ray rooms, physiological laboratories, private laboratories, and work-rooms, besides lecture-rooms, museums, and a library. A special laboratory is equipped for experimental work on the central nervous system. In the pathological laboratories ample provision is made for the teaching of pathology and bacteriology and for the prosecution of original research. The Helen Swindells Laboratory is specially equipped for cancer research and investigation in general pathology. Ample facilities for investigation are provided in Anatomy, Physiology, and Materia Medica. In the public health department, which is lodged in a separate institute in York Place, near the Royal Infirmary, suitable laboratory accommodation is provided for the study of sanitary chemistry, physics, and practical bacteriology in the departments of chemistry and physics and in that of pathology.

Clinical Studies.—The clinical and practical departments of medical study are taught partly in the Medical School and partly in the Royal Infirmary and St. Mary's Hospitals for Women and Children, a fever hospital, a lunatic asylum, and a convalescent home, and other special hospitals. Medical and Surgical Clinical Classes are conducted in the Infirmary, and separate instruction is afforded in the elements of Medical and Surgical Physical Diagnosis, in Obstetric Medicine, Ophthalmic Surgery, and Pathological Anatomy by the different members of the staff of the Medical School and Infirmary.

Clinical Instruction.—THE MANCHESTER ROYAL INFIRMARY.—The Royal Infirmary is built on the pavilion system, near the University, and has accommodation for 671 patients. The medical side consists of five units, each unit having a testing room for the scientific investigation of morbid products and a class-room. The surgical beds are also arranged in five units, each unit having its own operation theatre, with anæsthetising, recovery, sterilising, testing, and apparatus rooms, and its own class-room attached. All of these units are occupied. The fine educational block provides very handsomely for the wants and comforts of the students, there being separate suites of rooms for the men and the women, and also a large common reading room, a lecture theatre, and a museum. The present annual average number of in-patients is 13,650, of out-patients 27,000, and the list of casualties in the accident room has averaged 17,000 per annum. About 9000 operations are performed annually in the operation theatres. Associated with the infirmary are: (1) the Convalescent Hospital at Cheadle, containing 136 beds; (2) the Royal Lunatic Hospital at Cheadle, accommodating with its branches 430 patients; and (3) the Central Branch in the city for casualty and out-patient work, and 50 beds for pensioners. The Associated Hospitals thus contain 1244 beds and are under the same management. Women students are admitted on the same terms as men.

Fees.—Medical Practice: Three months, 7½ guineas; six months, 12 guineas; 12 months, 18 guineas; full period required by the Examining Boards, 60 guineas.

Two Entrance Scholarships in Medicine of the value of £160 each are offered annually by the Council of the Manchester University and the Medical Board of the Manchester Royal Infirmary for proficiency in Arts and Science subjects respectively. Other scholarships and prizes are mentioned in the College Syllabus. Numerous annual appointments and junior appointments may be held by those who have attended the practice of the Infirmary.

The Dean of Clinical Instruction is Dr. T. H. Oliver.

Manchester Children's Hospital, Pendlebury, Gartside-street, Manchester, and St. Anne's-on-the-Sea.—The hospital contains 190 beds and 28 in the Convalescent Home, St. Anne's-on-the-Sea. The medical staff visit the hospital daily at 10 A.M. Clinical instruction is given by the medical staff at the Hospital and Dispensary. There is a new Massage and Electro-therapeutic Department. Two Clinical Assistants are appointed for periods of three or six months. In throwing open these appointments to qualified medical men and women, the Board is actuated by the desire to aid those qualified medical men and women who wish to have opportunities for the further study of disease in children, or who wish to fit themselves for posts as Medical Officers to Children's Hospitals, to Child Welfare Centres, or for School Medical Officer appointments. There is a new Orthopædic Department. A special out-patients' day is held on Friday mornings at Gartside-street, and a ward at Pendlebury is devoted to cases needing operative treatment. Out-patients are seen daily at 9 A.M. at the Out-patient Department, Gartside-street, Manchester. Secretary: Mr. W. M. Humphry.

Manchester Northern Hospital for Women and Children, Park-place, Cheetham Hill-road, Manchester.—The hospital contains 70 beds. Out-patients are seen daily from 8.30 to 10 A.M.

UNIVERSITY OF LEEDS.

Four degrees in Medicine and Surgery are conferred—viz.: Bachelor of Medicine and Bachelor of Surgery (M.B. and Ch.B.), Doctor of Medicine (M.D.), Master of Surgery (Ch.M.), also Degrees and Diplomas in Dental Surgery and Diplomas in Public Health and in Psychological Medicine.

Degrees of Bachelor of Medicine and Bachelor of Surgery.—Candidates for these degrees are required to present certificates showing that they will have attained the age of 21 years on the day of graduation, and have attended courses approved by the University extending over not less than five years, two of such years at least having been passed in the University, one of which must be subsequent to the date of passing the First Examination. Candidates must also satisfy the examiners in the several subjects of the following examinations, entitled respectively: the Matriculation Examination, or such other examination as may have been recognised by the Joint Matriculation Board in its stead; the First Examination; the Second Examination; and the Final Examination.

The First Examination.—The First Examination consists of: Part I., Physics and Chemistry; Part II., Zoology and Botany. Candidates will be allowed to pass the two parts separately.

The Second Examination.—The Second Examination consists of: Part I., Anatomy and Physiology; Part II., Materia Medica and Pharmacy. Candidates will be allowed to pass the two parts separately.

The Final Examination.—The Final Examination consists of: Part I., Pathology and Bacteriology. Part II., Forensic Medicine and Public Health. Part III., Medicine: Systematic and Clinical, including Mental Disease and Diseases of Children; Surgery—Systematic, Clinical, and Practical; Obstetrics, and Gynæcology—Systematic, Clinical, and Practical; Pharmacology and Therapeutics. Candidates will be allowed to pass Parts II. and III. separately or together, and they may present themselves for examination in Part I. at the end of the tenth term.

These conditions are at present under review in connexion with the recommendations of the General Medical Council.

Degree of Doctor of Medicine.—Candidates are not eligible for the degree of Doctor of Medicine or Master of Surgery unless they have previously received the degrees of Bachelor of Medicine and Bachelor of Surgery of the University (or of Victoria prior to December, 1904) and at least one year has elapsed since they passed the examination for those degrees. Candidates for the degree of Doctor of Medicine are required to present a dissertation and, if the dissertation be accepted, may be required to pass an examination.

The first term commences on Oct. 1st. Prospectus, &c., can be obtained from the Dean of the Medical School.

Post-graduate work.—Practitioners wishing to attend Infirmary practice during short periods may do so on terms which may be obtained from the Dean.

Clinical Instruction.—**The Leeds General Infirmary**, in connexion with this medical faculty, has accommodation for 632 in-patients, including 88 beds at branch hospitals in the country. During the last year 10,277 in-patients and 41,857 new out-patients were treated. Clinical teaching takes place daily in the wards, and Clinical lectures are given in Medicine and Surgery by the Physicians and Surgeons. There are Medical, Surgical, Ophthalmic, Aural, Electro-therapeutic, and Radiographic Departments, in each of which special instruction is imparted to students. Gynæcological and Children's Departments, together with Laryngeal, Venereal, and Skin Clinics, are in operation, and there is a special ward for cases of nutritional disorders of children. Several valuable prizes are given at the end of each session. Numerous appointments at the Infirmary are annually open to students after qualification.

In addition to work in the General Infirmary, clinical instruction in obstetrics is given in the Leeds Maternity Hospital and in mental and infectious diseases in the Wakefield (W.R.) Asylum and Leeds City Fever Hospital respectively.

UNIVERSITY OF SHEFFIELD.

The Degrees in the Faculty of Medicine are Bachelor of Medicine and Bachelor of Surgery (M.B., Ch.B.), Doctor of Medicine (M.D.), and Master of Surgery (Ch.M.), Bachelor of Dental Surgery (B.D.S.), and Master of Dental Surgery (M.D.S.). There is also a Diploma of Licentiate in Dental Surgery. The courses and degrees in the Faculty of Medicine are open to men and women alike. Candidates must matriculate in the University or pass such other examination as may be recognised for this purpose by the University and sanctioned by the Joint Matriculation Board, and must pass also the further examination in Chemistry and Physics.

Degrees of Bachelor of Medicine and Bachelor of Surgery.—A candidate must have attained the age of 22 years on the day of graduation and have pursued the courses of study required by the University regulations during a period of not less than five years subsequently to the date of his matriculation and the passing of the further examination in Chemistry and Physics, three of such years at least having been passed in the University, one at least being subsequent to the passing of the First Examination.

The First Examination.—The subjects of the examination are Chemistry, Physics, and Biology. The Intermediate B.Sc. Examination in these subjects will, on payment of the required additional fee, be accepted instead of this examination. Candidates must, after matriculation and the passing of the further examination in Physics and Chemistry, and registration as medical students, have attended courses of instruction (lectures and laboratory work) in chemistry, physics, and biology for one year each.

The Second Examination.—The subjects of the examination are Anatomy and Physiology.

The Third Examination.—The subjects of the examination are Pathology, Pharmacology, Anatomy and Physiology. Candidates must have completed the Lent Term of the fourth year of professional study.

The Final Examination.—The subjects of the examination are Medicine (including Forensic Medicine, Public Health, Mental Diseases, and Diseases of Children); Surgery; and Obstetrics (including Gynæcology). Candidates must have completed the fifth year of professional study.

Degree of Doctor of Medicine.—Candidates for the egree of Doctor of Medicine must have passed the amination for the degrees of M.B., Ch.B. at least ne year previously, must present a thesis embodying bservations in some subject approved by the professor medicine, and must pass an examination in the rinciples and Practice of Medicine.

Degree of Master of Surgery.—Candidates must have ken the M.B, Ch.B. at least one year previously, nd must since have held for not less than six months surgical appointment in a public hospital.

The subjects of examination are Systematic, inical, and Operative Surgery, Surgical Anatomy rgical Pathology, and Bacteriology.

Scholarships, &c.—At this University, in addition four Edgar Allen scholarships of £125 a year for ree years, holders of which can take the courses the Faculty of Medicine, there are 8 scholarships nd a Town Trust Fellowship. Full particulars as to rriculum, scholarships, &c., may be had on applica- on to the Registrar or to the Dean of the Medical aculty.

The Medical School.—The new buildings of the niversity opened in 1905 are situated at the west nd of the city, adjoining Weston Park, and the edical Department occupies the entire north wing the University quadrangle. The various athletic nd other students' societies are under the manage- ent of the Union Representative Council, elected nnually. There are large and comfortable common oms both for men and women students. A refectory open daily at the University where students may btain refreshments, lunch, dinner, &c., at extremely oderate prices. The University journal, *Floreamus*, lited by a committee of staff and students, is ublished each term. The University Halls, "Oak- olme," Clarkehouse-road, and "Tapton Cliffe," lwood-road, are recognised by the Senate as lls of residence for women students; full par- culars may be obtained of the tutor for women udents.

Clinical Instruction.—The University is within easy ach of the various hospitals with which it is connected r clinical purposes. These are as follows: The OYAL INFIRMARY (Secretary, Mr. J. W. Barnes), ntaining 326 beds, with an annual average number over 3800 in-patients, over 11,500 out-patients, and er 23,000 casualties; the Royal Hospital (Hon. Sec., o *tem.*, to the medical and surgical staff, Mr. Vincent ownrow), with 191 beds, and an annual number of 00 in-patients, over 20,000 out-patients, and nearly ,000 casualties; and the Jessop Hospital for iseases of Women, with 80 beds, about 900 -patients, and about 3057 out-patients; also a aternity department, with about 450 in-patients r annum and about 700 out-patient cases attended. ecial courses on Fevers are held at the City Fever ospitals (600 beds) and on Mental Diseases at e South Yorkshire Asylum (1610 beds). For rposes of clinical practice the practices of the yal Infirmary and Royal Hospital are amal- mated, giving a total of 511 beds for the treatment medical, surgical, and special cases. There are ecial departments for the treatment of Diseases the Eye at each institution, with wards assigned to em. In addition to these the Royal Infirmary has ecial departments for the treatment of Diseases of e Skin and Ear, with beds assigned to them, whilst the Royal Hospital there are special out-patient partments for Diseases of the Throat, Ear, Skin, thopædics, and Mental Diseases. Instruction is o given at the South Yorkshire Asylum (1694 ds). During the last year over 6000 patients ssed through the wards of the two institutions, ile those attending as out-patients numbered er 45,000. The department of Pathology and cteriology in the University is fitted with every quirement for the most advanced work in these bjects.

Fees.—The Medical Composition Fee is £38 a year each of the five years.

UNIVERSITY OF BRISTOL.

In the Faculty of Medicine there are the following degrees:—Bachelor of Medicine and Bachelor of Surgery (M.B. and Ch.B.), Doctor of Medicine (M.D.), Master of Surgery (Ch.M.), Bachelor of Dental Surgery (B.D.S.), and Master of Dental Surgery (M.D.S.). There are also the following diplomas: Diploma in Public Health (D.P.H.), Diploma in Dental Surgery (L.D.S.), and Diploma in Veterinary State Medicine.

All candidates for degrees in Medicine, Surgery, and Dentistry are required to pass an examination called the School Certificate Examination, or to pass such examination as may be regarded as equivalent by the Senate. All courses, degrees, and diplomas are open to men and women alike.

Conjoined Degrees of Bachelor of Medicine and Bachelor of Surgery.—Candidates shall be not less than 21 years of age and shall have pursued the courses prescribed by University Regulations during not less than five years after passing the first examination in Chemistry and Physics, of which three shall have been passed in the University, and two of these three subsequent to pass in the second examination. All candidates for the degrees of M.B., Ch.B., are required to satisfy the examiners in the several subjects of three examinations.

The First Examination.—The subjects of examination are: Chemistry (Inorganic), Physics, and Biology, the courses pursued being those for the time being approved for the intermediate part of the B.Sc. curriculum. This part of the curriculum shall extend over one year. (Candidates who have passed the Higher School Certificate approved by the Board of Education in these subjects will not be required to sit for the first examination and will be regarded as having completed one year of study.)

The Second Examination.—The subjects of examination are: Organic Chemistry and Elementary Anatomy (Part I.) and Advanced Anatomy and Physiology (Part II.). Parts I. and II. may be passed separately or together.

The Final Examination.—The subjects of examination are: Materia Medica and Pharmacy, Pharmacology and Therapeutics, General Pathology, Morbid Anatomy, and Bacteriology (Part I.); Special Pathology, Forensic Medicine, Toxicology, and Public Health, Obstetrics (including Diseases of Women), Surgery (Systematic, Clinical, Practical, and Operative), Medicine (Systematic, Clinical, and Practical, including Mental Diseases) (Part II.). Candidates may pass I. and II. together, or separately, and Forensic Medicine and Toxicology may, at the option of the candidate, be taken either with Part I. or Part II.

Degree of Doctor of Medicine.—Candidates shall be Bachelors of the University of not less than two years' standing as such and may elect either (1) to pass an examination in General Medicine, or (2) to pass an examination in State Medicine, or (3) to present a Dissertation. The candidate who elects to pass the examination in State Medicine must hold a diploma in Public Health of some University or College, and the candidate who elects to present a Dissertation may be examined in the subject thereof.

Degree of Master of Surgery.—Candidates shall be Bachelors of not less than two years as such, during which period they shall have attended the Surgical Practice of an institution approved for the purpose. They shall pass an examination in Surgical Anatomy, Pathology, and Bacteriology, and Operative, Clinical, and General Surgery, and present to the University a Dissertation on some subject of Surgery. The degree may be taken also in General Surgery, and a Special Subject—e.g., Oto-Rhino-Laryngology, Ophthalmology, and Gynæcology.

Clinical Instruction.—The allied hospitals (BRISTOL ROYAL INFIRMARY and BRISTOL GENERAL HOSPITAL) have between them about 600 beds and extensive out-patient departments, special clinics for Diseases of Women and Children and those of the Eye Throat, and Ear, in addition to large and well-equipped departments for Dental work and large outdoor Maternity Departments.

At each of these institutions there are well-arranged pathological museums, post-mortem rooms, and laboratories for Morbid Anatomy. There are also laboratories for work in Clinical Pathology, Bacteriology, and Cytology, in which special instruction is given in these subjects. Departments are provided and well-equipped for X ray work, both for diagnosis and treatment, the various forms of Electrical treatment, including High Frequency Currents, Electric Baths, Finsen Light treatment, and Massage.

The students of the school also attend the practice of the Royal Hospital for Sick Children and Women, containing 140 beds, and that of the Bristol Eye Hospital, with 40 beds. The total number of beds available for clinical instruction is therefore about 750.

Appointments.—(1) Undergraduate: Clinical clerkships, dresserships, also ophthalmic, obstetric, pathological and ear, nose, and throat clerkships, are tenable at the Bristol Royal Infirmary and the Bristol General Hospital. In these institutions the dressers reside in rotation free of charge. (2) Post-graduate: At the Bristol Royal Infirmary: Four house surgeons, £120 each per annum; two house physicians, £120; resident obstetric and ophthalmic house surgeon, £120; throat, nose, and ear house surgeon, £120; dental house surgeon, £120. All these appointments are made for twelve months. From the resident officers a senior resident officer is appointed at a salary of £200. At the Bristol General Hospital: Senior resident medical officer, £300 per annum; casualty house surgeon, £125 per annum; two house physicians, £125 per annum; house surgeon, £125 per annum; special obstetric physician, £125 per annum; house surgeon to special departments, £125 per annum; dental house surgeon, £300 per annum. All these appointments are for six months, except that of senior resident medical officer, which is for two years.

Scholarships.—The following are among the scholarships and other awards open to students of the school: The Ashworth Hallett Scholarship, value £45, open to women only; Two Martin Memorial Pathological Scholarships of £10 each; the Tibbits Memorial Prize, value 9 guineas, for proficiency in practical surgery; the Committee's Gold and Silver Medals for fifth-year students for general proficiency; the Augustin Prichard Prize, value 7 guineas, for proficiency in anatomy; the Henry Clark Prize, value 11 guineas, for proficiency in gynæcology; the Crosby Leonard Prize, value 7 guineas, for proficiency in surgery; the Suple Surgical Prize, a gold medal and 7 guineas; the Suple Medical Prize, a gold medal and 7 guineas; the Henry Marshall Prize, value £12, for dressers; the H. M. Clarke Scholarship, value £15, for proficiency in surgery; the Sanders Scholarship, value £22 10*s.*, for general proficiency; the Barrett-Roué Scholarship for proficiency in diseases of the eye, ear, nose, and throat, value £14.

Daily Post-graduate Study.—For those who are able to devote several hours each day to hospital practice the University offers special facilities for Post-graduate work. Qualified medical practitioners may be appointed as Clinical Assistants for a period of one or more months. They may act as Assistants, if times permit, in more than one department and in any of the hospitals during their period of study. They will be entitled to the use of the clinical laboratories and medical library, and have the right to attend in all departments, including operations, post-graduate and ordinary clinical demonstrations, and post-mortem examinations. Fee, £3 3*s.* per month.

Post-graduate Clinical Work. — Demonstration courses with weekly lectures are held during May, June, and July. Fee, £2 2*s.* All inquiries and applications for admission should be addressed to the Director of Post-graduate Studies (Clinical Section), Pathological Department, University of Bristol, who can be seen on any day by appointment at the Pathological Department.

Further information as to scholarships, curricula, and fees can be obtained from the Dean of the Faculty of Medicine or the Registrar of the University.

UNIVERSITY OF WALES.

This University has, inter alia, the privilege of granting Degrees in Medicine, and Diplomas in Public Health and Tuberculous Diseases. Preliminary courses of study for the Degrees in Medicine may be pursued at any of the constituent Colleges of the University—viz., at Aberystwyth, Bangor, Cardiff, or Swansea. The Welsh National School of Medicine is situated in Cardiff and is an integral part of the University College there.

University College, Cardiff. Welsh National School of Medicine.—This School is staffed on the Unit System and whole-time Professors of Medicine, Surgery, Pathology, Preventive Medicine, Physiology, and Anatomy have already been appointed. Professors of Obstetrics and Gynæcology, and Tuberculosis, and a Lecturer in Materia Medica and Pharmacology have also been appointed. There are also Lecturers appointed in the various special subjects. The Courses of Instruction, which are open to both men and women students, are adapted to meet the needs of those preparing for Degrees in Medicine and Surgery in the University of Wales, and certain of them also for Degrees in other Universities, and for the Diplomas of licensing bodies.

Students can complete the whole of their curriculum in the School, and qualify for the degrees of M.B., B.Ch. in the University of Wales. Hospital instruction is given at the Cardiff Royal Infirmary, at the City Lodge Hospital, and at other recognised Institutions. The attention of students about to matriculate is drawn to the numerous entrance scholarships offered for competition at the University College, Cardiff, most of which may be held by medical students. Full particulars of the examination for these may be obtained by application to the Registrar. Medical men wishing to prepare for the Diploma in Public Health or the Tuberculous Diseases Diploma of the University of Wales can attend complete courses of instruction in the School. Prospectuses can be obtained on application to the Dean of the Faculty of Medicine, or to Mr. D. J. A. Brown, Secretary, at University College, Cardiff.

Clinical' Instruction.—King Edward VII. Hospital, Cardiff: Founded 1837. 450 beds.—Swansea General and Eye Hospital: Hospital, 260 beds, 225 civilians, 35 (sailor and soldier pensioners); Convalescent Home, 26 beds.

ENGLISH MEDICAL CORPORATIONS GRANTING DIPLOMAS.

EXAMINING BOARD IN ENGLAND BY THE ROYAL COLLEGE OF PHYSICIANS OF LONDON AND THE ROYAL COLLEGE OF SURGEONS OF ENGLAND.

Under this heading we give the regulations for the examinations enjoined by the Conjoint Examining Board of the Royal Colleges of Physicians of London and Surgeons of England and of the Society of Apothecaries upon students desiring their respective diplomas of qualification. We do not give any list of schools recognised by these bodies as eligible to prepare students for their examinations beyond mentioning that all the schools which we have already described (under the heading of the Universities to which they are attached) are recognised as suitable places of instruction by the corporations granting medical diplomas. The courses of study at the principal colonial medical schools are also recognised as qualifying for the examinations of these corporations.

1. *Regulations applying to all candidates who passed he required Preliminary Examination in General Education before Jan. 1st*, 1923.

Professional Examinations.—There are three Examinations, called herein the First Examination, the Second Examination, and the Third or Final Examination, each being partly written, partly oral and partly practical. These examinations will be held in the months of January, April, July, and September or October unless otherwise appointed. Every candidate must give notice in writing to Mr. F. G. Hallett, O.B.E., Secretary of the Examining Board, Examination Hall, Queen-square, Bloomsbury, W.C., 14 clear days before the day of the examination, transmitting at the same time the required certificates.

The subjects of the *First Examination* are—Chemistry, Physics, and Elementary Biology. A candidate may take this examination in two parts at different times (Chemistry and Physics must be taken ogether until the required standard is reached in both or in one of these subjects, but a candidate will not be allowed to pass in one without obtaining at the same ime at least half the number of marks required to pass in the other). A candidate will be admitted to examination in Chemistry and Physics, and in Elementary Biology on producing evidence of having passed the required Preliminary Examination and of having received instruction in these subjects at a ecognised institution. A candidate rejected in one part or more of the First Examination will not be admitted to re-examination until after the lapse of a period of not less than three months from the date of ejection, and he will be re-examined in the subject or ubjects in which he has been rejected. If referred in Chemistry, Physics, or Biology he must produce vidence of further instruction at a recognised instiution. Any candidate who shall produce satisfactory vidence of having passed an examination for a degree n Medicine in any of the subjects of this examination onducted at a university in the United Kingdom, in ndia, or in a British colony will be exempt from xamination in those subjects.

The fees for admission to the *First Examination* re as follows: For the whole examination, First dmission, £10 10*s.*; re-examination in Chemistry, 3 3*s.*; re-examination in Physics, £2 2*s.*; re-examinaon in Biology, £3 3*s.* Second Conjoint: This xamination is in two parts—viz.: Part I., Anatomy nd Physiology; Part II., Materia Medica and harmacology. A candidate must have attended at recognised medical school, lectures on Anatomy, hysiology, and a course of Practical Physiology nd Histology, and have dissected for twelve onths during the ordinary sessions. He must also tend three months' lectures or demonstrations in harmacology and receive instruction in Practical harmacy. Part II. may be passed at the same time s Part I., or before or after that part, provided the onditions of admission to the whole examination ave been fulfilled. The study of Anatomy and hysiology before passing in two of the three subjects the first examination is not recognised. If rejected, candidate before being admitted to re-examination ust continue his studies at a recognised medical hool for not less than three months.

Second Examination: £10 10*s.*; re-examination in art I., £6 6*s.*; re-examination in Part II., £3 3*s.*

The subjects of the *Third* or *Final Examination* e: Part I., Medicine, including Medical Anatomy, thology, Therapeutics, Forensic Medicine, and ublic Health. Part II., Surgery, including Pathogy, Surgical Anatomy, and the use of Surgical ppliances. Part III., Midwifery and Diseases eculiar to Women. Candidates may present themlves for Parts I., II., and III. of the examination parately or together at the expiration of not less an two years (24 months) from the date of passing e Second Examination on production of the certifites of study required for the respective parts, ovided that the examination is not completed fore the expiration of five years from the date of ssing the Preliminary Examination.

The fees for admission to the *Third* or *Final Examination* are as follows: Third Examination: £21; re-examination in Part I., Medicine, £6 6*s.*; Part II., Surgery, £6 6*s.*; Part III., Midwifery and Diseases of Women, £4 4*s.* Members of English, Scotch, or Irish Universities £5 5*s.* for first admission to the examination and £36 15*s.* for the diplomas.

A candidate referred on the *Third* or *Final Examination* will not be admitted to re-examination until after the lapse of a period of not less than three months from the date of rejection and will be required, before being admitted to re-examination, to produce a certificate, in regard to Medicine and Surgery, of having attended the Medical and Surgical Practice, or the Medical or Surgical Practice, as the case may be, during the period of his reference; and in regard to Midwifery and Diseases Peculiar to Women a certificate of having received, subsequently to the date of his reference, not less than three months' instruction in that subject by a recognised teacher.

2. *Regulations applicable to candidates who passed the required Preliminary Examination in General Education on or after Jan. 1st*, 1923.

Students are required to pass a *Pre-Medical Examination* in Chemistry and Physics conducted by the Conjoint Examining Board before commencing the five years curriculum of professional study or some other examination recognised by the Board—namely, the examination in Chemistry and Physics for the degree in Medicine of any University recognised by the Board; the Higher School Certificates of Oxford and Cambridge Universities, and the Oxford and Cambridge Schools Examination Board; the Higher Certificates of London, Bristol, Durham Universities, and the Joint Matriculation Board of the Northern Universities. A candidate must enter for Chemistry and Physics together, and he will not be allowed to pass in one without obtaining at the same time at least half the number of marks required to pass in the other subject. He will be admitted to the examination on producing evidence of having passed the required Preliminary Examination in General Education and of having received instruction during 180 hours in Chemistry and 120 hours in Physics to the satisfaction of his teachers. These courses may be commenced or attended before the required Preliminary Examination in General Education is passed. The examination is partly written, partly oral and partly practical. A candidate rejected in one or both subjects of the examination will not be admitted to re-examination until after the lapse of a period of not less than three months and he must produce evidence of further instruction in the subject or subjects of failure. The fee for the examination is £3 3*s.*, for re-examination in Chemistry £2 2*s.*, and for re-examination in Physics £1 1*s.*

There are two Professional examinations called the *First* and *Final Examinations*. The courses of study for these examinations must not be commenced until the Pre-Medical examination in Chemistry and Physics or some equivalent examination has been passed.

The subjects of the First Professional Examination are: Section I. (*a*) Anatomy, including Histology and Embryology. (*b*) Physiology, including Bio-Chemistry. Section II. Pharmacology, Practical Pharmacy and Materia Medica. A candidate must have attended at a recognised Medical School courses of instruction in Anatomy, including Embryology during five terms, during which he must have dissected the whole body, courses of instruction in Physiology, including General Biology, Bio-Chemistry and Bio-Physics during five terms, courses of instruction in Pharmacology, Practical Pharmacy and Materia Medica. A candidate may present himself for the two Sections together or separately, but he must take parts (*a*) and (*b*) of Section I. together until he has passed in one or both parts, but a candidate will not be allowed to pass in one part unless he obtains at the same time at least half the number of marks required to pass in the other part.

Section II. of the examination may be passed at any time before the candidate enters for the Final Professional Examination. The fee for the First Professional Examination is £10 10*s.*, for re-examination after rejection in Section I. £6 6*s.*, for re-examination after rejection in either part of Section I. £3 3*s.*, for re-examination after rejection in Section II. £3 3*s.* A candidate who produces satisfactory evidence of having passed an examination in the subjects of Section I. or of either part of Section I. and of Section II. in the examination for the degree in Medicine conducted at a University recognised by the Board will be exempted from further examination in such subject or subjects.

Final Professional Examination.—The subjects of the Final Professional Examination are: Section I. (*a*) Pathology, including Morbid Anatomy, Morbid Histology and Clinical Pathology. (*b*) Bacteriology. Section II. Part I. Medicine, including Medical Anatomy, Forensic Medicine and Public Health. Part II. Surgery, including Surgical Anatomy and the use of Surgical Appliances. Part III. Midwifery and Gynæcology. The examination is partly written, partly practical, partly clinical and partly oral. A candidate may take Sections I. and II. and the three parts of Section II. of the Final Examination separately or may take the whole examination together. He will be required to produce the certificates required by the regulations before being admitted to the respective parts of the examination. A candidate who produces evidence of having passed an examination for a degree in medicine in the subjects of Pathology and Bacteriology at a University recognised by the Board is exempted from Section I. The fee for admission to Section I. is £4 4*s.*; for admission to Section II., Part I., £10 10*s.*; Part II., £10 10*s.*; Part III., £6 6*s.*; and the re-examination fees are respectively £3 3*s.*, £6 6*s.*, £6 6*s.*, and £4 4*s.*

Students of recognised universities in England, Scotland, and Ireland, who have passed examinations for a degree in Medicine at their universities in the subjects of the First and Second Examinations of the Examining Board, may enter for the Final Examination at the expiration of two years from the date of passing in Anatomy and Physiology on production of the required certificates.

Members of certain recognised Indian, Colonial, and Foreign universities who have passed examinations for the Degree of Doctor or Bachelor of Medicine or Surgery in the subjects of the First and Second Examinations of the Examining Board may present themselves for the Final Examination under special conditions. The Board also grants Diplomas in Public Health, in Psychological Medicine, in Ophthalmic Medicine and Surgery, and in Tropical Medicine and Hygiene. Candidates must hold a Medical qualification registrable in the United Kingdom or be Graduates in Medicine of a recognised Indian, a Colonial, or a Foreign University. Particulars and conditions of admission to all examinations, fees, &c., may be obtained from the Secretary of the Examining Board, Examination Hall, Queen-square, Bloomsbury, London, W.C.

ROYAL COLLEGE OF PHYSICIANS OF LONDON:

THE MEMBERSHIP AND FELLOWSHIP.

The College confers two separate diplomas—the *Fellowship*, a purely honorary distinction, and the *Membership*, obtained by examination.

Membership.—Every candidate must have attained the age of 25 years, and be already registered or have passed a qualifying examination in accordance with the Medical Act of 1886, or obtained the degree of Doctor or Bachelor of Medicine at a University in the United Kingdom, in India, or a British colony, or foreign qualification, for which the courses of study and the examinations have been adjudged by the Censors' Board to be satisfactory. The nature and extent of this examination will, in the case of each candidate, be determined by the Censors' Board. All other candidates must produce proof of having passed the examinations required for the Licence of the College. The examination is directed partly to pathology and partly to the practice of medicine. The fee for admission as a Member of the College is 40 guineas, except when the candidate for Membership is a Licentiate of the College, in which case the fee already paid for the Licence shall be deducted from the 40 guineas. The fee for the examination is £6 6*s.*

Fellowship.—The *Fellows* are selected annually from the ranks of the *Members* by the Comitia of the College.

ROYAL COLLEGE OF SURGEONS OF ENGLAND:

THE FELLOWSHIP.

The Royal College of Surgeons of England confers its diploma of Fellow upon a few distinguished persons in an honorary capacity. Two Members of long standing may also be elected to the Fellowship annually. But the bulk of the Fellows obtain the diploma as the result of examination.

Fellowship.—The examination for the Fellowship is divided into two parts—viz., the First Examination and the Second Examination. The subjects of the First Examination are Anatomy and Physiology, and those of the Second Examination are Surgery, including Surgical Anatomy and Pathology. The examinations are partly written and partly vivâ voce and include the examination of patients and the performance of operations on the dead body. The First Examination will in future years be held in June and December and the Second Examination in May and November.

The fees for examination are:—First Examination, first admission 8 guineas, and for each re-admission 5 guineas. Second Examination, each admission, 12 guineas. Of such examination fees 20 guineas will be reckoned as part of the fee payable upon admission to the Fellowship. The fee to be paid upon admission to the Fellowship is 30 guineas, except when the candidate is a Member of the College, in which case the fee is 20 guineas.

A Member of the College is admissible to the First Examination at any time after receiving his Diploma of Membership. A candidate who is not a Member is admissible after passing the First and Second Examinations of the English Conjoint Board, of the equivalent examinations in his University, on the production of certificates of attendance upon certain prescribed courses.

A Member of the College is admissible to the Second Examination at any time after having passed the First Examination, on producing satisfactory evidence of having been engaged not less than six years in the study (or study and practice) of the profession.

A candidate who is not a Member of the College must possess the registrable surgical and medical degrees of universities recognised by the Council and must have been engaged in the study (or study and practice) of the profession for not less than four years subsequent to the date of obtaining the recognised qualification, one year of which shall have been spent in attendance on the Surgical Practice of a recognised hospital. The diploma of Fellow is not conferred upon successful candidates until they have attained the age of 25 years.

The Regulations may be obtained on application to the Director of Examinations, Examination Hall, Queen-square, Bloomsbury, London, W.C. 1.

SOCIETY OF APOTHECARIES OF LONDON.

The Primary examination is held quarterly in two parts. Part I. Elementary Biology; Chemistry, Chemical Physics; Practical Chemistry; and Materia Medica and Pharmacy. Part II. includes Anatomy, Physiology, and Histology. This examination cannot be passed before the completion of twelve months Practical Anatomy with Demonstrations, and these subjects cannot be taken separately except in the vent of the candidate having previously passed ι one.

The Final examination is held monthly except in eptember. Part I. Clinical Surgery: Principles and ractice of Surgery, Surgical Pathology, and Surgical natomy, Operative Manipulation, Instruments, and ppliances. Part II. Clinical Medicine: Medicine, harmacology, Pathology, and Morbid Histology; orensic Medicine, Hygiene, Theory and Practice of accination; and Mental Diseases. Part III. includes idwifery, Gynæcology, and Diseases of New-born hildren and the Use of Obstetric Instruments and ppliances.

The course of study for the *Final examination*, ıcludes attendance on the Surgical and Medical ractice, with Post-mortem Examinations, at a ɔspital connected with a medical school for a period two winter and two summer sessions, including a ɔurse of Practical Midwifery, with attendance on 20 idwifery cases. The course of medical study must ktend over five years, and the offices of dresser or inical clerk must be held at a hospital or other stitution recognised by the Society. Two years ust elapse after a candidate has passed the examinaon in Anatomy and Physiology before sitting for any art of the Final examination.

Evidence shall also be given of practical instruction Infectious Diseases and in Mental Diseases (at a natic asylum or in the wards of an institution conining a special ward set apart for the treatment of ental diseases), and in any two of the following ıbjects: Ophthalmic Surgery, Laryngology with hinology and Otology, Dermatology, and Diseases Children. Candidates intending to present themlves for examination are required to give 14 days' otice. The fee for the Licence is 20 guineas. Female ındidates are admitted to examinations. The examiation offices are open from 10 A.M. to 4 P.M.; on aturdays from 10 A.M. to 1 P.M. All letters should be ldressed to the Secretary, Court of Examiners, ɔciety of Apothecaries of London, Blackfriars, E.C. 4.

ETROPOLITAN ANCILLARY SCHOOLS AND HOSPITALS AFFORDING FACILITIES FOR CLINICAL OBSERVATION.

The institutions which follow provide to the medical udent and medical graduate facilities for different rms of instruction and clinical observation. In each ıse further information can be obtained from the cretary of the hospital.

THE SEAMEN'S HOSPITAL SOCIETY possesses three ɔspitals—the *Dreadnought* Hospital at Greenwich, 0 beds, and the Branch Hospital in the Royal ictoria and Albert Docks, E., 50 beds; the Hospital r Tropical Diseases, Endsleigh-gardens, 50 beds, ɔndon, N.W. 1; King George's Sanatorium for ilors, Bramshott, Hants, 80 beds, and the Angas ome, 30 beds. It has also a Dispensary in the East dia Dock-road from which patients are transferred the hospitals. The London School of Tropical edicine is attached to the Hospital for Tropical seases. Sessions commence approximately pt. 25th, Jan. 9th, and July 24th. Students must qualified Medical Practitioners or be in the fifth ar of their medical studies. Accommodation for 0 Students. Fully equipped Laboratories are proled for the study of Entomology, Helminthology, otozoology, and General Medical Zoology.

In conjunction with the Fellowship of Medicine rangements have been made for a short course stributed over four weeks. Secretary: Sir P. J. chelli, C.M.G.

WEST LONDON HOSPITAL, Hammersmith, W. 6.—ıis hospital has 159 beds, all of which are constantly use. 2319 in-patients and 36,374 out-patients, ıose attendances numbered 182,697, were treated st year. Attached to the hospital is the West ɔndon Post-Graduate College. The practice of the spital is reserved exclusively for qualified men, no ıior students being admitted. Instruction is given in the medical and surgical out-patient rooms and demonstrations are given in the wards. Clinical assistantships are obtainable in the various general and special out-patient departments. Special classes are held in Diseases of the Throat and Nose, Skin, and Eye, and in Gynæcology, Medical Electricity, Operative Surgery, Bacteriology, Anæsthetics, Intestinal Surgery, Medical and Surgical Diseases of Children, Blood and Urine, Clinical Microscopy, Cystoscopy, Venereal Diseases, and Operative Ophthalmology, Radiography, X Ray Therapy. The accommodation for post-graduates consists of a lecture room, together with reading, writing, and class rooms, &c. The hospital has a fully equipped pathological laboratory at which instruction is given in elementary bacteriology. The fees for hospital practice, including lectures, are £4 4*s.* for one month, £9 9*s.* for three months, or £22 1*s.* for one year. The certificate of the hospital is accepted by the Admiralty, War Office, Colonial Office, and India Office in cases of study leave. Further information can be obtained on application to the Dean, Dr. Arthur Saunders, at the Hospital. Secretary of the Post-graduate College: Mr. C. Cole. Secretary of the Hospital: Mr. H. A. Madge.

ROYAL NORTHERN HOSPITAL, Holloway-road, N. 7.—This hospital is recognised by the Examining Board in England of the Royal Colleges of Physicians and Surgeons as a place of study during the fifth year of the medical curriculum. Besides the honorary staff there are six anæsthetists, pathologist, resident medical officer, two resident house physicians three resident house surgeons, and resident casualty officer. The hospital contains 210 beds, which are fully occupied. There is also a ward for children under five years of age. The large rectangular and circular wards, each of which contains 25 beds, the observation wards, the two operation theatres, general and special out-patient and pathological departments, are specially designed with a view of offering the greatest facilities for clinical work. There is also a well-appointed physiotherapeutic department. The pathological department has been extended and is under the control of a Director of Clinical Pathology. The Reckitt Convalescent Home at Clacton-on-Sea belongs to the Hospital. It contains 30 beds. Special departments have also been established for the treatment of tuberculosis and venereal diseases. A Hospital of Recovery containing 60 beds has now been established at "Grovelands," Southgate, patients being removed from the main hospital by ambulance five or six days after operation. Medical practitioners are cordially invited to see the general and special practice of the hospital. Demonstrations are given daily in the wards and out-patients departments. Clinical assistants (qualified), clinical clerks, and pathological clerks are appointed in the general and special departments and may receive certificates at the end of their terms of office.

Special Departments.—During the past year special departments have been created in genito-urinary and neurological diseases and a fracture department.

Post-graduate Facilities.—In association with the Fellowship of Medicine two-week "refresher" courses have been arranged for March, July, and November in each year. These will include teaching in general medicine and surgery, and special lectures and demonstrations in special subjects.

Further particulars from the Secretary of the Medical Committee at the Hospital.

PRINCE OF WALES'S GENERAL HOSPITAL, Tottenham, N. 15.—This hospital is in the midst of a densely populated neighbourhood and contains medical, surgical, gynæcological, and children's wards, having 125 beds. There are special departments for gynæcological cases, diseases of the eye, ear, throat, and nose, skin diseases, plastic surgery, medical electricity, radiography, and dentistry. Operations are performed every afternoon of the week (except Saturday) at 2.30 P.M. Clinical instruction, ordinarily including laboratory classes, and lectures are given in the wards and outpatient departments, laboratories, and lecture hall in connexion with the North-East London Post-Graduate College attached. There are four resident medical officers, and clinical assistants are appointed under certain conditions. A special intensive post-graduate course will be held in the autumn. Further particulars in regard to the hospital may be obtained from Mr. E. Gillespie, Secretary to the Medical Committee, 24, Weymouth-street, W. 1; or from Dr. J. B. Banister, Dean of North-East London Post-Graduate College, 39, Harley-street, W. 1.

London Temperance Hospital, Hampstead-road, N.W. (Established 1873; Incorporated 1917).—The hospital contains 120 beds. The in-patients in 1922 were 1059, and the out-patients and casualties numbered 13,141 new cases. The medical and surgical practice of the hospital is open to students and practitioners. Operations: Mondays at 2 p.m., Tuesdays, Wednesdays, Thursdays, and Fridays at 9 a.m.

Hampstead General and North-West London Hospital.—The Hampstead General Hospital (Haverstock-hill) and the North-West London Hospital (formerly at Kentish Town) have been amalgamated since 1907. The Hampstead General Hospital (128 beds—viz., 102 free, 6 isolation, &c., and 20 paying or contributory) accommodates the in-patients from the districts hitherto served by both hospitals. The out-patients, with the exception of Hampstead casualty and emergency cases, attend exclusively at the Out-patients department, Bayham-street, Camden Town. Further particulars from the Secretary at the hospital.

South London Hospital for Women, South Side, Clapham Common, S.W.; Out-patient Department: 86-90, Newington Causeway, S.E.—This hospital, officered entirely by medical women, is a general hospital for women, girls, and small children of both sexes, and provides accommodation for 80 patients. All diseases are treated with the exception of acute infectious fevers and mental disease. There are Ophthalmic, X ray and Electrical, Pathological, Physio-Therapeutic, and Dental Departments. The hospital is a centre for the treatment of venereal diseases under the Public Health (Venereal Diseases) Regulations, 1916. The provision of additional facilities for post-graduate training for medical women is one of the special objects of the hospital. The number of in-patients treated during the year 1922 was 1187. At the Out-patient Department in Newington Causeway 8275 new cases were treated during the past year, the total number of out-patient attendances amounting to 32,045. Clinical assistants (qualified women only) are from time to time appointed in the Out-patient Department. Two resident students act as clinical clerks in the surgical wards. Secretary: Miss M. E. Ridler.

French Hospital and Dispensary, Shaftesbury-avenue, W.C.—This hospital, which was founded in 1867 to afford medical treatment for poor foreigners who speak the French language, has 74 beds. The Convalescent Home and Retreat for Aged French People at Brighton contains 61 beds. Secretary: Mr. G. Pondepeyre.

Italian Hospital, Queen-square, W.C.—This institution was established in 1884 for the maintenance and medical treatment of Italian and Italian-speaking people, irrespective of their religious and political opinions, who may be suffering from sickness or bodily infirmity, but the sick poor of any nationality are also admitted for treatment. The institution also provides surgical and medical relief to Italians and others not being inmates of the hospital. It has 50 beds.

German Hospital, Dalston, E. 8.—This hospital was founded in 1845 with the object of supplying medical aid to poor people speaking the German language and for others in cases of emergency and accident. It has 138 beds and a sanatorium with 10 beds.

National Hospital for the Paralysed and Epileptic (Albany Memorial), Queen-square, Bloomsbury, W.C.—The hospital, with the Finchley branch, and branches in Bloomsbury and Clapham Park, contains 265 beds and cots. The out-patient physicians attend every Monday, Tuesday, Thursday, and Friday at 2 p.m., and the physicians daily. Clinical clerks are appointed under physicians and clinical assistants to out-patient physicians. Post-graduate Courses of Lectures and Demonstrations are held three times every year, usually commencing in January, May, and October and lasting eight weeks. Special Courses in Neurological Ophthalmology, Neuro-Pathology, and the Anatomy and Physiology of the Nervous System are given. The Pathological Laboratory is available for special work under the Pathologist. The hospital has been recognised by the Conjoint Board of England as a place where part of the fifth year may be devoted to clinical work. All communications concerning clinical appointments, lectures, hospital practice, and fees should be addressed to the Secretary at the hospital.

Hospital for Epilepsy and Paralysis, &c., Maida Vale, W. (85 beds).—Both in-patient and out-patient departments of this hospital are open free to students as well as to medical graduates. Secretary and General Superintendent: Mr. H. W. Burleigh. The out-patient department is open every week-day except Saturday at 2 p.m.

West End Hospital for Nervous Diseases.—Out-patient Department, 73, Welbeck-street, W. 1; In-patient Department, Gloucester Gate, Regent's Park, N.W.; 72 beds, over 42,000 Out-patient attendances. A Pathological Department is now installed and further improvements are to be carried out in the summer vacation. A series of clinical demonstrations, apart from the general practice of the hospital, is held regularly each session and the hospital is coöperating with the Fellowship of Medicine in the programme of special post-graduate teaching organised by the Association. The Savill Memorial Prize (value £15) and Medal are offered annually for competition among post-graduate and undergraduate students who have attended at the hospital. For further particulars apply to C. C. Worster-Drought, M.D. (Dean), or to J. P. Wetenhall, B.A. (Oxon.), Secretary, 73, Welbeck-street, W. 1.

Bethlem Royal Hospital, St. George's-road, S.E. —This hospital is open for the admission of two Resident House Physicians who have recently obtained their diplomas to practise Medicine and Surgery. They are permitted to reside in the hospital for a term generally not exceeding six months, commencing May 1st and Nov. 1st, and are provided with apartments, complete board, attendance, laundry, and a salary at the rate of £100 per annum. They are under the direction of the Physician Superintendent and are elected by the Committee from candidates whose testimonials appear to be most satisfactory. The students of certain specified London Medical Schools receive clinical instruction in the wards of the hospital and qualified practitioners and other students may attend for a period of three months on payment of a fee. A Department for Nervous Diseases has been instituted in a building quite apart from the main hospital. Neurological and early mental cases are dealt with. A Course of Lectures and Practical Instruction for the Diploma in Psychological Medicine granted by the various Universities, will commence in the middle of September. For particulars apply to the Physician Superintendent.

Hospital for Consumption and Diseases of the Chest, Brompton.—The hospital contains 333 beds. The Sanatorium at Frimley contains 100 beds and 50 beds for paying patients. Six house physicians reside in the hospital for a term of six months; their duties include attendance in the out-patient department. An additional month may be spent at the Sanatorium. Pupils are admitted to the practice of the hospital: terms £1 1*s.* for one month; three months, £2 2*s.* Clinical Demonstrations are given throughout the year by members of the medical staff. Clinical assistants are appointed to the physicians in the out-patient department and clinical clerks to the hysicians in the wards. The hospital has been ecognised by the Conjoint Board for England as a lace where six months of the fifth year may be spent clinical work. The medical practice of the hospital also recognised by the University of London, the pothecaries' Society, and the Army and Navy and ıdian Medical Boards. Dean of the Medical School: r. L. S. Burrell, from whom particulars of lectures, inical appointments, and hospital practice can be ɔtained.

City of London Hospital for Diseases of the eart and Lungs, Victoria Park, E. 2.—During the ıst year 1201 in-patients have been treated in ıe wards. The out-patients treated during 1922 ımbered 9951. Special Departments: Surgical, aryngological, X ray, Electro-Cardiographic. Assist-ıts are appointed to the Clinics, and a limited number research workers to the Pathological Department. he In-patient staff visit generally in the afternoon, ıd welcome medical practitioners; Out-patients at P.M. Graduates desiring Assistantships in any partment should apply to the head of the Department. Physicians to In-patients: W. J. Hadley, H. Colbeck, Clive Riviere, A. G. Levy, A. J. Scott-nchin, F. G. Chandler; Surgeon: W. H. C. Romanis; aryngologist: W. G. Howarth; Physicians to Out-ıtients: Sir Percy W. Bassett-Smith, J. B. Alexander, B. Christopherson; Electro-Cardiographic Department: Dr. A. J. Scott-Pinchin; Radiologist: Dudley Stone; Pathologist: S. R. Gloyne. Tuberculosis spensary (Boroughs of Bethnal Green and part ackney) Tuberculosis Officers: H. T. Howell and W. Hamilton. Other information from the Secre-ry of the Hospital.

Royal Chest Hospital (for all affections of the art and lungs), City-road, E.C. (80 beds). Branch the Royal Northern Hospital, Holloway.—This spital provides accommodation for 80 in-patients. cpenditure for 1922 £15,068, income £11,476. The tendance of out-patients averages 30,000 annually. cretary: Mr. G. G. Panter.

The Mount Vernon Hospital for Tuberculosis D Diseases of the Lungs and Heart, North-ood, Central Out-patient Department, Fitzroy-uare, W.—The hospital contains 157 beds, Medical d Surgical; 50 beds reserved for children requiring rgical aid. Number of in-patients, 473; out-tients, 2024. Resident Medical Staff. Clinical monstrations are given by the Visiting Medical aff at the hospital at Northwood. Clinical assistants appointed to physicians in the wards and in the t-patient department. Secretary: Mr. W. J. Morton.

Queen Charlotte's Lying-in Hospital and dwifery Training School, Marylebone-road, W.—This hospital receives about 2000 patients nually, besides having a large out-patient depart-nt. Medical pupils are received at all times of the ar. Pupils have unusual opportunities of seeing stetric complications and operative midwifery, on ount of the very large number of primiparous es—nearly one-half of the total admissions. nical instruction is given on the more important es which present themselves. They also receive uable instruction in the Ante-natal Department, ere over 4000 patients attend yearly. Special cture-demonstrations are given by members of the ff. Certificates of attendance at this hospital are ognised by all the Universities, Colleges, and licens-bodies. Pupil midwives and monthly nurses are eived and specially trained. A Residential College vides accommodation for five men at a time, dents and qualified practitioners, and is opposite hospital, with which it is in telephonic communi-ion. Arrangements have been made for Medical ıdents to receive the preliminary instruction in ıctical Midwifery recommended by the General dical Council. Women students are received. further particulars application should be made to Arthur Watts, Secretary, at the hospital.

Hospital for Women, Soho-square, W.—The teaching in connexion with the above hospital has been greatly extended, and is available for Post-Graduates only, in limited numbers. Every facility is afforded them, by the teaching staff, of obtaining experience in diagnosis and treatment of Gynæcological diseases. The hospital contains 68 beds, and the out-patient attendances are over 14,000 per annum. Operations take place daily at 2 o'clock except on Saturdays. The X ray department is supplied with the latest installation both for diagnosis and treatment, and experience can also be gained in the treatment of malignant disease by means of radium. Incorporated with the hospital is the London School of Gynæcology, comprising attendance in Out-patient Department, operating theatre, clinical lectures, and X ray treatment. For further particulars apply to the Secretary.

Samaritan Free Hospital for Women, Marylebone-road, N.W.—Qualified practitioners are admitted as clinical assistants to both the in- and out-patient departments. The fees, payable in advance, are £3 3*s.* for three months. Full particulars may be obtained on application to the Secretary at the hospital. There are 70 beds. Secretary: Mr. G. H. Hawkins.

East London Hospital for Children and Dispensary for Women, Glamis-road, Shadwell, E. —The hospital maintains 130 cots, and on an average 245 out-patients are seen daily. Clinical instruction is given by the physicians and surgeons to the hospital, which is recognised by the Conjoint Board for England as a school of medical teaching for students in the fifth year of the curriculum. All particulars may be obtained on application to the Secretary. Two clinical clerkships for qualified or unqualified students are open every three months subject to reappointment if desired. Clinical assistants (qualified men only) are from time to time appointed in the out-patient department. Any additional information may be obtained on applying to Mr. W. M. Wilcox, the Secretary.

The Hospital for Sick Children, Great Ormond-street, W.C. 1, contains 244 beds. The hospital having been recognised by the Conjoint Board for England as a place where, under the new curriculum, six months of the fifth year may be spent in clinical work, the practice is arranged to meet this need and is open to students of both sexes who have completed four years of medical study and also to qualified medical men and women. The medical staff are recognised by the University of London as teachers in Diseases of Children. Arrangements have also been made with University College Hospital and the London School of Medicine for Women for the routine admission of their students of both sexes to clerkships and dresserships in the wards. Appointments are made every three months to six medical clerkships, which are open to students of the hospital. Clinical instruction is given daily by members of the visiting staff. Fees for hospital practice, one month, £2 2*s.*; three months, 5 guineas; perpetual ticket, 10 guineas. Clinical Clerks, 1 guinea for one month. Ophthalmological Clerkships.—Clinical Clerks are appointed once a month. Fees £1 1*s.* for one month's attendance. Pathological Clerkships.—Facilities are afforded for obtaining theoretical and practical instruction in Clinical Pathology and Bacteriology in the Pathological Laboratories. Clerks attend for about four hours daily. Fees: For one month, £3 3*s.*; for two months, £5 5*s.*; for three months, £6 6*s.* A reduction is made in the case of those already holding tickets for general attendance at the hospital. Time so spent in clerking and dressing is recognised by the Universities of London, Oxford, and Cambridge, and by the Conjoint Board for England as part of the approved curriculum for students entering for a final examination. These appointments are open to students of all recognised medical schools. In addition, special lectures in post-graduate work are held throughout each term of the year, as well as routine post-graduate instruction daily. Details may be obtained by application to the Dean or Secretary at the hospital. The medical school is a constituent part of the new London Post-Graduate Association. Secretary: Mr. James McKay.

Evelina Hospital for Sick Children,* Southwark Bridge-road, S.E.—This hospital contains 76 cots and a very extensive Out-patient Department. About ten clinical assistants (either sex), to work with the Honorary Medical Staff for Out-patients, are appointed quarterly for a period of three months; there is no salary attached to these posts: but, on the other hand, no fees are charged.

Victoria Hospital for Children, Tite-street, Chelsea, S.W.—The hospital contains 130 beds and has a large out-patient department (over 1400 weekly); the home at Broadstairs has 50 beds. Out-patients are seen as under:—Diseases of the Eye: Tuesday, 2 p.m. Diseases of the Skin: Monday, 1.45 p.m. Whooping-cough Cases: Friday, 2 p.m. Dental Cases: Thursday, 1.30 p.m. Medical and Surgical Cases: Mornings at 9.30 and 11.30. Accidents and urgent cases are admitted at any time. Secretary: Mr. D. St. John Bamford.

A Private Nursing Home for Children is now open at 29, Tite-street, in connexion with and adjacent to the hospital. Terms: £1 1*s.* per day or £5 5*s.* per week. Application for admission should be made to the Secretary. Patients must be under the care of a consultant of one of the hospitals of London, and the question of payment for his fees is a matter of arrangement between him and the child's parents.

Queen's Hospital for Children (*late North-Eastern Hospital for Children*), Hackney-road, Bethnal Green, E. 2. (Telephone 305 and 534 Dalston.) For the sick children of the poor under 14 years of age. Established 1867. 134 beds in London and 36 at the seaside branch, "Little Folks" Home, Bexhill.—During the past year 1878 in-patients and 43,647 out-patients (attendance 115,027) were received. The surgeons attend on Tuesdays at 9.30 a.m. and Wednesdays and Fridays at 1.45 p.m.; the physicians daily at 1.45 p.m., except Saturday, and Wednesday and Friday, 9.30 a.m., as well as 1.45 p.m. Whooping-cough Physician: Saturday, 9.30 a.m. The practice of the hospital is open to students by arrangement with the medical staff. Clinical demonstrations open to medical practitioners and students of medicine will be announced in the medical journals. Applications should be made to the Secretary, Mr. T. Glenton-Kerr.

Belgrave Hospital for Children, Clapham-road, S.W.—Clinical Assistants (men or women) are from time to time appointed to the members of the Visiting Staff attending in the Out-patient Department at this hospital, and facilities are given for attendance in the wards.

Alexandra Hospital for Children with Hip Disease (late of Queen-square, W.C.), Kettlewell Home, Swanley, Kent (in connexion with St. Bartholomew's Hospital).—At this hospital cases of hip-disease, spinal caries, and tuberculous diseases of other bones and joints are treated. Students who have obtained a recommendation from their teachers can attend to see the practice. In-patients, Swanley, Kent; Out-patients, St. Bartholomew's Hospital; Fridays, 1.30 p.m. Apply for particulars to the Dean of the Medical College, St. Bartholomew's Hospital, London, E.C. 1.

Royal London Ophthalmic Hospital (Moorfields, 1804–1899), City-road, E.C. 138 beds.—This hospital, known as Moorfields Eye Hospital, was moved in 1899 to larger buildings in City-road. Last year there were 2614 in-patients, the out-patients were 47,532 of whom 40,735 were new out-patients, and the attendances were 117,120. Operations are performed daily from 10 a.m. to 1 p.m., and four surgeons attend on each day. Students are admitted to the practice of the hospital. Fee for six months, £3 3*s.*; perpetual, £5 5*s.* Special courses of instruction, which extend over a period of five months, are given by members of the Surgical Staff; beginning in October and March. A composition fee of 24 guineas (£25 4*s.*) will entitle students to a perpetual ticket, and will admit them once to all the lectures and classes and to the examination for the hospital's full certificate. A special course is also held in the preliminary subjects (Anatomy, Physiology, and Optics) for the various degrees in Ophthalmology. The fee for this course is 12 guineas. Students of the hospital are eligible for the offices of house surgeon or clinical and junior assistants. Junior assistants are appointed every three months. Any further information will be furnished by Mr. Robert J. Bland, Secretary Superintendent.

Royal Westminster Ophthalmic Hospital, King William-street (next door to Charing Cross Hospital), Strand, W.C. 2.—The hospital contains 42 beds. Out-patients, who number over 14,000 annually, are seen daily at 1 p.m., and operations are performed in the theatre at 3 p.m. The practice of the hospital is open to both men and women practitioners and students. Clinical evenings, at which interesting cases are shown and discussed, are held twice each term at 8 p.m. on the second Tuesday of the month. In addition to the ordinary clinical instruction, a systematic course of Lectures and Practical Classes commences in October and May. Lectures in this course are given daily (except on Saturday) at 4.30 p.m., including all subjects required by candidates for the D.O.M.S., R.C.P. & S. Eng., Part II., and practical instruction is given in Operative Surgery and Ophthalmic Pathology and Bacteriology. A corneal microscope has recently been purchased and instruction in the Microscopy of the Living Eye can now be obtained. Fees: One month, £1 1*s.*; three months, £2 2*s.*; six months, £3 3*s.*; perpetual, £5 5*s.*; composition fee for perpetual ticket and attendance at classes (except Operative Surgery and Pathology, for which fee in each case is £2 2*s.* per course), £10 10*s.* Students of the hospital are eligible for appointment as house surgeon, assistant house surgeon, refraction assistant, and senior or junior clinical assistant. Full details can be obtained on application to the Dean.

Royal Eye Hospital, St. George's-circus, Southwark, S.E. 1.—There are 40 beds and 2 cots. In 1922 there were 50,911 attendances in the Out-patient Department, the new patients being 20,923. The daily average of attendances was 169 patients. In-patient admissions numbered 946. Clinical instruction is given to students and post-graduates daily at 2.30 p.m., and Lectures, Demonstrations, and Laboratory Classes are arranged in preparation for examinations in Ophthalmology. Post-graduate students are eligible for appointment as Clinical Assistants and as Refraction Officers. Dean: Mr. A. D. Griffith.

Central London Ophthalmic Hospital, Judd-street, St. Pancras, W.C.—This hospital has 40 beds and clinical teaching is given daily. Classes of instruction in the use of the ophthalmoscope, with demonstrations on cases, and also classes on refraction and other subjects, to meet the requirements of the Conjoint Board for the D.O.M.S., and of the University of London for the M.S. in Ophthalmology, are given during the winter months, commencing in October. The out-patient work begins at 1 o'clock, and operations are performed daily between 2 and 4 o'clock. This school is recognised as a teaching institution by the Universities of London and Oxford, and the Conjoint Board of the Royal Colleges of Surgeons and Physicians. The school has also undertaken to receive a portion of the pupils of the University College Hospital for the purposes of ophthalmic training. The Pathological and Bacteriological Laboratories have been rendered available for the use of any ophthalmic surgeons who desire to send specimens for examination. A small fee is charged for a report. Secretary: H. R. S. Druce.

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* No returns.

Western Ophthalmic Hospital, Marylebone-road, .W.—16 beds. Out-patient attendances, 30,264. oth In-patient and Out-patient Departments of this ospital are open to medical graduates. Fees £1 1*s.* per ree months. Honorary Secretary: H. W. Burleigh.

National Hospital for Diseases of the Heart, estmoreland-street, London, W. (founded 1857).—he practice of the hospital, both in the wards and t-patient department, is open daily to post-graduates d others, and will be found valuable by those eking the higher qualifications—e.g., M.D., M.R.C.P., c. Systematic courses of instruction, with lectures d clinical demonstrations, are arranged during the inter and summer sessions; in addition an intensive urse, of roughly a fortnight's duration, takes place in ebruary, July, and October of each year. The hospital fully equipped with all the modern instruments for e investigation of the diseases of the Cardio-Vascular stem, and facilities exist for those requiring practical instruction in Electro-cardiography, X Rays, and her graphic methods. Clinical Assistants in the ut-patient Department are appointed from time to me. For further particulars apply to the Dean of e Medical School (Dr. Parsons-Smith), or to the ecretary, at the hospital.

Hospital for Diseases of the Throat, Golden-uare, W. (with which is amalgamated the London hroat Hospital, Great Portland-street).—Clinical struction in the diagnosis and treatment of disease given daily in the out-patient department from 2 to P.M., and on Tuesdays and Fridays from 6.30 to P.M. The hospital contains 60 beds for in-patients. here is an annual out-patient attendance of over ,000. Minor operations are performed on Tuesdays, ednesdays, and Thursdays, at 9.30 A.M. Major erations are performed on Tuesdays, Wednesdays, hursdays. and Fridays, at 10 A.M. Also Thursdays d Fridays at 2 P.M. Practitioners and medical udents are admitted to the practice of the hospital a fee of £5 5*s.* for three months, £7 7*s.* for six months, £10 10*s.* for perpetual studentship. From amongst e students junior clinical assistants are appointed riodically. For terms and further information apply the Dean, Mr. Lionel Colledge.

Central London Throat, Nose, and Ear ospital, Gray's Inn-road, W.C.—The practice of e hospital is largely consultative. The hospital open daily to all qualified medical practitioners on esentation of their visiting cards. Demonstrations the cases and clinical instruction are given daily the chief surgeon of each clinique. Systematic ctures and Demonstrations are given on Tuesdays d Fridays at 4 P.M. An intensive Course of Lectures th demonstration of cases is given from time to ne. Consultations on interesting cases take place the second Wednesday in each month at 4 P.M. inical Assistants are appointed and are expected to ld office for at least three months. They are required attend twice weekly at 1.30 o'clock for the after-on, and at 4.30 o'clock for the evening Clinics. Full llabus can be obtained on application to the Dean.

The Metropolitan Ear, Nose, and Throat ospital.—The hospital is in Fitzroy-square, W. e Out-patient Department is opened daily (Satur-ys excepted) at 2.30 P.M. to all medical practitioners d senior students for acquiring clinical instruction d technical knowledge. Operations upon in-patients e performed on Tuesdays, Wednesdays, and ursdays at 10 A.M. Fee for one month's attendance the hospital £3 3*s.*, and for three months £5 5*s.* inical Assistants are appointed as vacancies occur, d have responsible duties. Applications should be ade to the Secretary, L. L. Phillips.

Royal Ear Hospital.—This hospital is now the r, Nose and Throat Department of University llege Hospital. All out-patient clinics are now held University College Hospital in Gower-street, but rd visits and operations by the staff take place ch afternoon (except Fridays and Saturdays) at ean-street.

St. Mark's Hospital for Cancer, Fistula, and other Diseases of the Rectum, City-road, E.C. (Founded 1835.)—The hospital contains for men and women 54 beds. Operations are performed on Mondays, Wednesdays, and Thursdays at 2.30 P.M. Medical practitioners and students are invited to the operations and to the clinical instruction in the wards and in the out-patient department. Average out-patient attendances, 4000 per year. Average in-patients, 675 per year.

St. Peter's Hospital for Stone and other Urinary Diseases, Henrietta-street, Covent Garden. Established 1860. New Hospital opened 1882.—The hospital contains 30 beds for men and 2 beds for women and children. Medical practitioners and students are invited to the clinical instructions which are given in the wards and out-patient department daily, and to the operations in the theatre on Mondays at 2.30 P.M., and Wednesdays and Fridays at 2 P.M. Average beds occupied daily, 30; average out-patients seen daily, 100.

St. John's Hospital for Diseases of the Skin, 49, Leicester-square, W.C. 2.—The in-patient department, 40 beds, is at 262, Uxbridge-road, W. 12. The out-patient practice is open to the medical profession every day at 2 and every evening (except Saturday) at 6. At all clinics demonstrations on the different diseases presenting themselves are given. Venereal Diseases, under the Government scheme, are admitted at all clinics. The X ray Department is open on Monday, Tuesday, Thursday, and Friday afternoons. The Chesterfield Lectures are given on Thursdays at 6 P.M., October to March, commencing Oct. 11th. At the end of the course the Chesterfield medal may be competed for by those who have attended three-fourths of the lectures. Special laboratory courses in Pathology and Bacteriology of the Skin may be arranged for.

London Lock Hospital and Home (Founded 1746).—In the Institution at Harrow-road, W. 2, there are 202 beds, and 616 in-patients and 8550 out-patients were dealt with in 1922. In the Male Department and Out-patient Department in Dean-street, Soho, W., there are 42 beds, which during 1922 accommodated 372 patients. 81,243 out-patients were treated. 3301 injections of substitutes for salvarsan, &c., were made in 1922. Male patients are seen at 91, Dean-street on Mondays and Tuesdays from 1 to 2 P.M., and from 6 to 8 P.M.; on Wednesdays from 6 to 8 P.M.; on Thursdays, 1 P.M. (male out-patients), 5 P.M. (female patients); on Fridays from 5 to 7 P.M. (male patients); and on Saturdays from 2 to 4 P.M. (males). Pathological Department, daily at 6.30 P.M. Intravenous injections are given at every clinic at 91, Dean-street, W. 1. Female patients are seen at 283, Harrow-road, Paddington, on Mondays, Tuesdays, Wednesdays, and Thursdays at 2 P.M. to 3 P.M., and irrigations are given every evening from 5 to 8 P.M. Irrigations for males are given daily 8 to 10 P.M. For females Mondays, Tuesdays, Wednesdays, Thursdays, and Fridays at 11 A.M. to 1 P.M., at 91, Dean-street. The next Special Course of Lectures will be held in October. Secretary, Henry J. Eason, Head Office, 283, Harrow-road, W. 9.

ENGLISH PROVINCIAL ANCILLARY SCHOOLS AND HOSPITALS.

Under this heading we include all the hospitals which are recognised by the English Royal Colleges for a part of the required attendance on medical and surgical practice, for medical clerkships, and surgical dresserships. The list includes nearly every hospital of a general character in the country having more than 150 beds, though occasionally a large hospital is omitted because equally good opportunities are afforded to students at other institutions in its neighbourhood, while a small hospital may be included because no such facilities for study are present elsewhere. The list is arranged alphabetically as to the town where the hospital is located. Most of the larger general hospitals of the kingdom have already been noticed in connexion with the Universities.

Bath Royal United Hospital, Bath.—This hospital contains 134 beds, and possesses X ray, Massage, Bacteriological Departments, a new Pathological Laboratory, and a fine library. Secretary: Mr. J. M. Sheppard. V.D. Clinics are held on Tuesdays (for women), and on Fridays and Saturdays (for men), from 5 to 7 P.M., and Ear, Throat, and Nose Clinics on Thursdays, at 4 P.M.

Bedford County Hospital, Bedford.—This hospital has 100 beds, with X ray and Pathological Departments, paying wards for 15 beds, and a convalescent home (20 beds) at Aspley Heath, near Woburn Sands, in connexion with the institution. The hospital is approved by the University of London for the purposes of the M.D. and M.S. Examinations. Secretary: Mr. Beauchamp Wadmore.

Bradford Royal Infirmary, Bradford. — This hospital contains 215 beds. The material passing through the surgical wards consists of major operations, chiefly abdominal, and gynæcological work, and affords excellent facilities for either students or post-graduates. There are special clinics for Orthopædic and Venereal cases. Plans for a new hospital of 382 beds have been adopted, and building operations will be commenced as soon as funds will allow.

Royal Sussex County Hospital, Brighton (225 beds).—This hospital affords ample facilities for students, possessing a large out-patient department, including Ophthalmic, Dental, Dermatological, Gynæcological, X ray, and Orthopædic sections, and a well-appointed clinical research and bacteriological department. The hospital does not take resident pupils, but out-pupils may attend the practice of the hospital for any period not exceeding two years, on payment in advance of a fee, not exceeding 20 guineas, as the Board of Management shall direct.

Kent and Canterbury General Hospital, Canterbury.—The hospital contains 115 beds. Pupils of the staff are admitted to the practice of the hospital. Operations four days of the week. There is an Ophthalmic Department with two wards for in-patients, a Venereal Clinic, an Orthopædic Department, &c. Secretary, Mr. F. P. Carroll.

Coventry and Warwickshire Hospital, Coventry (established 1840).—This hospital contains 241 beds, and a new wing as well as theatre and kitchens have been added. Special clinics are held for diseases of the Eyes, Ears, Nose and Throat; Gynæcology; X ray and Electrical Treatment. There are also V.D. Clinics. Clinical students are received, and there are paying wards. Secretary: Miss R. Hooper.

Derbyshire Royal Infirmary, Derby.—This hospital contains 320 beds. It was founded in 1810, and was entirely rebuilt and enlarged 1892–1915 on the most modern lines at a cost of over £144,000. There is a separate ophthalmic block of 33 beds, a separate children's block of 34 beds, and a special department for gynæcological cases. There are four resident house surgeons, a resident house physician, and an assistant house surgeon and casualty officer. There are also well-equipped orthopædic, X ray, electrical, and venereal diseases departments. Registered medical students are admitted to witness the medical and surgical practice on payment of 10 guineas annually.

Royal Devon and Exeter Hospital, Exeter.—The hospital contains 225 beds (including special children's wards) and has a good library, museum, post-mortem room, and pathological laboratory. Attendance on the practice of this hospital qualifies for all the examining boards. There is also a Private Nursing Staff attached to the hospital. For particulars as to fees, &c., apply to the Matron. A new wing was added in 1897 and the "Victory" wing for the treatment of discharged disabled soldiers and sailors completed and opened in 1922. Arrangements may be made by which gentlemen in practice desiring to increase their qualifications may have the use of the museum and library and other facilities and by which students may attend midwifery. A new Operating Theatre was opened in 1906 (the gift of Mrs. Nosworthy of Newlands, Dawlish, Devon). The Electrical Treatment Department (the gift of Mrs. M. A. Sanders) was opened in 1907 by Lady Duckworth-King. A department was opened in 1917 for the treatment of genito-urinary diseases; there are three sessions per week, two for men at 3 P.M. and 7 P.M., and one for women at 3 P.M.

West of England Eye Infirmary, Exeter.—Secretary: Mr. W. W. Beer. The infirmary contains 64 beds. Students of the Exeter Hospital can attend the practice of the Eye Infirmary. Patients for the year ending Michaelmas, 1922, 3288. A ward is set aside for newly-born babies suffering from infectious eye diseases. The mothers are accommodated with their babies.

Gloucestershire Royal Infirmary and Eye Institution, Gloucester.—This hospital, which was granted the title of "Royal" on the occasion of King Edward VII.'s visit to Gloucester in the year 1909, has 140 beds. Secretary: G. Hurford. In-patients, 1526; out-patients, 8281. An electrical and massage department has been established and venereal clinic opened. Also ear, nose and throat department and X ray Department.

North Staffordshire Infirmary, Hartshill, Stoke-on-Trent.—The New Infirmary, opened in 1869, is built on the pavilion plan, has accommodation for about 304 patients, including Children's wards, and a special department for the treatment of Diseases of the Eye, a special X Ray and Electrical Department, a special department for the treatment of Diseases of the Ear, Nose, and Throat, a special orthopædic department, and venereal diseases clinics, so that there are excellent facilities for acquiring a practical knowledge of the profession. During the last six years the sum of £35,000 has been spent on new buildings and alterations. A new Out-patient Department, costing £12,000, a new Children's Ward of 30 beds, a new Pathological Department, and a second large Operation Theatre are amongst the structural improvements already completed. The whole institution is now equipped in a thoroughly up-to-date manner. Secretary and House Governor: Mr. W. Stevenson.

Hull Royal Infirmary, Hull.—This Hospital contains 266 beds, and since its establishment in 1782 until the erection of the circular wards in 1907 has undergone steady additions and improvements, including an up-to-date pathological department recently added. A branch convalescent home at Withernsea is a special feature of the charity.

Leicester Royal Infirmary, Leicester.—Instruction in the infirmary for first-year students is duly recognised by the various examining bodies. At the General Infirmary there are 233 beds, and at the Children's Hospital in connexion 70; venereal diseases, 17; total 320. A new wing containing 100 beds is in course of construction. A reconstruction scheme has been carried out, and £200,000 spent on bringing the accommodation of the institution to a modern standard of efficiency. This scheme has included the provision of two modern operating theatres, and self-contained out-patients' department. The Children's Hospital has been reconstructed and enlarged by the addition of a third ward at a cost of £14,500. Open-air balconies on all three floors are a feature. A central sterilising department has been provided. Pathological Laboratories and post-mortem rooms have recently been opened at a cost of £11,000, also an orthopædic out-patient department at a cost of £9500, £5000 of which was provided by the Freemasons of the province as their war memorial. The Nurses' Home has recently undergone enlargement by 60 bedrooms. The 150th anniversary of the Institution has recently passed and an effort is being made to raise a sum of £100,000 a commemoration. Funds are being raised for the oundation of a City University, and a splendid site vas presented by the late Mr. T. Fielding Johnson, .P., an ex-chairman of the Royal Infirmary. There re eight resident salaried medical officers at the Infirmry—viz., four house surgeons, one house physician, ne assistant house physician, and two dressers. he posts are usually filled half-yearly and afford xceptional opportunities for post-graduate experience nd senior students. Dressers are given an honorarium. tudents are encouraged to make full use of the facilities hich exist to gain clinical knowledge in the wards. he hon. medical and surgical staff are wishful of fording instruction in a variety of conditions which n active and well-equipped general hospital in a large ommercial centre is called upon to treat. A new esidency for Doctors is in course of erection. Chairan of the Board: Mr. T. Fielding Johnson, J.P. eputy Chairman of the Board: Mr. C. J. Bond, .M.G., F.R.C.S. House Governor and Secretary: r. Harry Johnson, from whom information as to rospective vacancies on the Resident Staff may be btained.

NORTHAMPTON GENERAL HOSPITAL, Northampton. –Two new wings were opened in 1904 and the old uildings entirely renovated and rearranged. The umber of beds is 231, 34 of which are occupied by ischarged disabled pensioners. Non-resident pupils eceived and have every opportunity of acquiring a ractical knowledge of their profession. The fee is 10 10*s.* Pupils can be received at any time. An p-to-date Pathological Laboratory has recently been rected.

NORFOLK AND NORWICH HOSPITAL, Norwich.—This ospital has at present 300 beds. There is a convalesent home at Cromer. Students are admitted to the ractice of the Hospital for a fee of £5 5*s.* for six onths. Secretary: Mr. Frank Inch.

NOTTINGHAM GENERAL HOSPITAL.—There are at is hospital 310 beds available for medical and rgical patients, and 46 beds are in the detached ard known as "The Cedars" Convalescent Hosital. The Medical and Surgical Staffs consist f two Honorary Consulting Physicians; 2 Honorary onsulting Surgeons, 1 Honorary Consulting hysician in Venereal Diseases; 3 Honorary hysicians; 4 Honorary Surgeons; 2 Honorary ssistant Physicians; 2 Honorary Assistant Surgeons; Honorary Aural Surgeons; 1 Honorary Dermatoloist; 2 Honorary Anæsthetists; 1 Honorary Surgeon entist and 1 Honorary Medical Officer in Charge of ray and Electro-therapeutic department. The esident Medical Staff consists of 2 House Physicians, House Surgeons and 1 Casualty Officer. The special epartments are the Ear, Nose and Throat, Skin, ental, Massage and Exercise, X ray, Orthopædic, lectro-therapeutic. House Governor and Secretary: r. P. M. MacColl. Assistant Secretary: Mr. John Birbeck.

SOUTH DEVON AND EAST CORNWALL HOSPITAL, lymouth.—This hospital contains 190 beds (14 of hich are for Venereal Diseases in a separate building). here is also an Out-patient Venereal Diseases Clinic. here is a Pathological Laboratory, special departents for X ray and Electro-therapeutics, an Outtient Orthopædic Clinic under the Ministry of ensions, and a civil Orthopædic Department. Penoners are received as in-patients. The hospital is a ntre for the treatment of Tropical Diseases.

ROYAL HOSPITAL, Portsmouth (founded 1847).— he number of beds is 160. There are X ray d Massage Departments. The hospital is a preratory school of Medicine and Surgery; the attennce of pupils is recognised by the Examining oards. Particulars of the Secretary at the hospital.

ROYAL BERKSHIRE HOSPITAL, Reading.—This hostal, which contains 220 beds, was enlarged in 1912, d includes an Out-patient Department, a Casualty Department, an X ray Department, Electro-therapeutic and Massage Department, a V.D. clinic, a Laboratory, an Eye Theatre, Eye Wards, and Motor and Horse ambulances. The hospital is approved by the General Nursing Council as a Training School for Nurses.

SALISBURY GENERAL INFIRMARY, Salisbury.—This hospital contains 145 beds. The average attendance is: in-patients, 108 daily average; out-patients, 16,112, including ophthalmic cases 279, X ray cases 731; attendances on 6433 casuals. Secretary: Mr. S. B. Smith.

ROYAL SALOP INFIRMARY, Shrewsbury.—This hospital has 130 beds. In-patients, 1570; out-patients, 1100; out-patients' attendances for the year, 14,434; accidents and casualties, 2291. A site has been purchased adjoining the present Infirmary structure, and it is proposed to erect an annexe for children thereon. Secretary: Mr. Alfred Sugden.

ROYAL SOUTH HANTS AND SOUTHAMPTON HOSPITAL, Southampton.—This hospital contains 130 beds. In-patients, 2801; out-patients, 10,945. Secretary: Mr. T. A. Fisher Hall.

STAFFORDSHIRE GENERAL INFIRMARY, Stafford (established 1766).—This hospital has 102 beds. In-patients, 817; out-patients (new cases), 2927. Secretary: Lieutenant A. E. Collins.

ROYAL HANTS COUNTY HOSPITAL, Winchester.—This hospital has 173 civilian beds. Secretary: Mr. Herbert Maslen.

WOLVERHAMPTON AND STAFFORDSHIRE GENERAL HOSPITAL, Wolverhampton.—There are 210 beds. Special departments for Children, Infectious cases, Gynæcology, Ear, Throat, and Nose Diseases, Electro-therapeutic and X ray, Venereal Disease, Pathological Laboratory, and Electro-cardiographic Installation. There is an excellent library. The resident officers are a resident medical officer, resident casualty surgeon, and two house surgeons. Pupils are allowed to witness the whole of the practice of the hospital and to be present at operations and have every opportunity of acquiring a practical knowledge of their profession. A course of Practical Pharmacy is given by the dispenser. Fees on application. Applications should be made to the Secretary of the Medical Committee.

WORCESTER GENERAL INFIRMARY, Worcester.—This hospital has 132 beds (temporarily reduced to 70). Pupils are taken by members of the Honorary Medical and Surgical Staff. Number of operations last year 930. New X ray and Electrical and Wolfram Arc Light, and Ear, Nose and Throat Departments have been erected and are now in use. Additional accommodation for the Honorary Staff and Out-patients and also an Outdoor Shelter in connexion with the Children's Ward have been built as a memorial to King Edward VII. In-patients, 1107; out-patients, 3587. Secretary: Mr. E. J. Holland.

YORK COUNTY HOSPITAL, York.—This hospital contains 170 beds. There are balconies for outdoor treatment, two installations of X ray apparatus, electro-therapeutic and massage department, and clinical laboratory. A Venereal Diseases Clinic is held.

SCHOOL OF THE PHARMACEUTICAL SOCIETY OF GREAT BRITAIN.—The subjects of the Qualifying examination of the Pharmaceutical Society are:—Part 1: (*a*) Chemistry; (*b*) Physics; (*c*) Botany. Part 2: (*a*) Materia Medica: (*b*) Pharmacy, including Posology and the Translation and Dispensing of Prescriptions; (*c*) the law relating to the keeping, selling, and dispensing of poisons and poisonous substances. Fee, 12 guineas; for each subsequent examination after failure, 3 guineas. The advanced or Major examination (for registration as "pharmaceutical chemist") includes botany, chemistry and physics, practical chemistry, and materia medica. Fee, 3 guineas. The courses of instruction given in the Society's school cover the entire ground for both examinations. Medical students are admitted to the lectures and laboratory work in any or all the courses. Certificates of instruction in the School are received by the Conjoint Board of the Royal Colleges and by the University of London. Graduates in Science may carry out the research work necessary for the thesis for the Ph.D. of the University of London in the Society's Research Laboratories. Application for admission to the school, or for further information, may be made to the Dean, Prof. Greenish, 17, Bloomsbury-square, London, W.C. 1.

II.—SCOTLAND.

THE UNIVERSITIES.

UNIVERSITY OF EDINBURGH.

Four Degrees in Medicine and Surgery are conferred by the University of Edinburgh—viz., Bachelor of Medicine (M.B.), Bachelor of Surgery (Ch.B.), Doctor of Medicine (M.D.), and Master of Surgery (Ch.M.). The degree of Bachelor of Surgery cannot be conferred on any person who does not at the same time obtain the degree of Bachelor of Medicine, and similarly the degree of Bachelor of Medicine is not conferred on any person who does not at the same time obtain the degree of Bachelor of Surgery.

No one is admitted to the degrees of *Bachelor of Medicine* and *Bachelor of Surgery* who has not been engaged in Medical and Surgical study for five years.

Candidates for the degrees of M.B. and Ch.B. must have attended for at least three academic years the medical and surgical practice either of the Royal Infirmary, Edinburgh, or of a general hospital elsewhere which accommodates not fewer than 80 patients and possesses a distinct staff of physicians and surgeons. They must have attended courses of instruction in Clinical Surgery and Clinical Medicine each of nine months, and courses of instruction in all the subsidiary subjects. They must have attended a course of instruction in Practical Midwifery and have personally conducted at least 12 cases of labour.

With respect to the places and institutions at which the studies of the candidate may be prosecuted the following regulations have effect:—Two of the five years of medical study must be spent in the University of Edinburgh. The remaining three years may be spent in any University of the United Kingdom, or in any Indian, Colonial, or Foreign University recognised for the purpose by the University Court, or in such medical schools or under such teacher as may be recognised for the purpose by the University Court. Of the subjects of study—viz., Anatomy, Practical Anatomy, Chemistry, Practical Chemistry, Materia Medica, Physiology, Practical Physiology, Practice of Medicine, Surgery, Midwifery and Diseases of Women, Pathology, Practical Pathology, Physics, Botany, Zoology, Medical Jurisprudence, and Public Health—not less than one-half must be taken in the University of Edinburgh, which corresponds to the two years above referred to.

Women are admitted to graduation in medicine under the same conditions as men.

The fee to be paid for the degrees of Bachelor of Medicine and Bachelor of Surgery is £34 13*s.*, and the proportion of this sum to be paid by a candidate at each division of the examination shall be as follows—viz.: For the First Division of the Examination (Botany, Zoology, Physics, and Chemistry), £9 9*s.*; for the Second Division (Anatomy and Physiology), £7 7*s.*; for the Third Division (Pathology and Materia Medica and Therapeutics), £6 6*s.*; and for the Final Division (Surgery and Clinical Surgery, Medicine and Clinical Medicine, Midwifery, Clinical Gynæcology, and Forensic Medicine and Public Health), £11 11*s.*

Bachelors of Medicine and *Bachelors of Surgery* may proceed to the degrees of *Doctor of Medicine* and *Master of Surgery* after they have spent one year in the medical or surgical wards respectively of a hospital, or the Military or Naval Medical Services, or in scientific work bearing directly on their profession, or two years in practice. In each case an examination must be passed and a thesis submitted for approval of the Faculty. The fee to be paid for the degree of M.D. is £21, and the fee to be paid for the degree of Ch.M. is £21.

Post-Graduate Instruction.—Courses of instruction are given for the Degrees of B.Sc. and D.Sc. in Public Health and for the University Diplomas in Public Health, Tropical Medicine and Hygiene, and Psychiatry. These Diplomas are open to approved registered practitioners as well as to graduates in Medicine and Surgery of the University. The University also takes part in the Courses given under the auspices of the Edinburgh Post-Graduate Courses in Medicine. In the departments of the Faculty of Medicine provision is made for research by students of graduate standing. In the University laboratories facilities will be provided for candidates for the Degree of Ph.D. whose applications to engage in research have been accepted by the Senatus.

The University of Edinburgh is especially rich in scholarships and prizes in medical subjects. Full particulars can be obtained from the Dean of the Medical Faculty.

SCHOOL OF MEDICINE OF THE ROYAL COLLEGES, Edinburgh.—The number of students varies much in the classes and subjects. It is within the limit to say that about 1000 students avail themselves each session of the opportunity of attending the school. The lectures qualify for the University of Edinburgh and other Universities, the Royal Colleges of Physicians and Surgeons of London, Edinburgh, and Dublin, the Faculty of Physicians and Surgeons of Glasgow, and other Medical and Surgical and Public Boards.

The practical classes and laboratories will open and the lectures commence on Oct. 9th.

In accordance with the statutes of the University of Edinburgh one-half of the qualifying classes required for graduation may be attended in this school. The regulations require that the fee for any class taken for graduation in Edinburgh shall be the same as that for the corresponding class in the University. The whole education required for graduation at the University of London may be taken in this school.

Special courses of instruction for dental students are also included in the curriculum of this school.

The minimum cost of the education in this School of Medicine for the Triple Qualification of Physician and Surgeon from the Royal Colleges of Physicians and Surgeons of Edinburgh and the Faculty of Physicians and Surgeons of Glasgow, including the fees for the Joint Examinations, is about £170, payment of which is distributed over the period of study. There is no composition fee.

Further particulars regarding the school, also its calendar (price 6*d.*) may be had on application to the Dean of the School, 11, Bristo-place, Edinburgh.

In connexion with the University and Royal Colleges Post-Graduate Instruction is given each year, chiefly in the Summer Vacation (July–September). Special Courses are arranged for, and particulars may be had on application to the Hon. Secretary, Post-Graduate Courses in Medicine, University New Buildings, Edinburgh.

Clinical Instruction.—ROYAL INFIRMARY, Edinburgh.—This hospital has 921 beds and 42 cots for children. Courses of Clinical Medicine and Surgery are given by the physicians and surgeons to male and female students. Special instruction is given on Diseases of Women, Physical Diagnosis, Diseases of the Skin, Diseases of the Eye, the Ear, the Larynx, and the Teeth. Separate wards are devoted to Venereal Diseases, Diseases of Women, Diseases of the Eye, the Ear, Throat and Nose, and the Skin, and also to cases of Incidental Delirium or Insanity. There are also large and complete Medico-Electrical and X Ray Departments. Post-mortem examinations are conducted in the anatomical theatre by the pathologist and his assistants, who also give practical instruction in Pathological Anatomy and Histology. The fees for hospital attendance are as follows—viz.: Perpetual ticket, in one payment, £12; annual ticket, £6 6*s.*; six months, £4 4*s.*; three months, £2 2*s.*; monthly, £1 1*s.* Separate payments amounting to £12 12*s.* entitle the student to a life ticket. The appointments are as follows: 1. Resident physicians and surgeons are appointed and live in the house free of charge. The appointment is for six months, but may be renewed at the end of that period by special recommendation. 2. Non-resident house physicians and surgeons and clinical assistants are appointed for six months. The appointment may be renewed for a like period by special recommendation. 3. Clerks and dressers are appointed by the physicians and surgeons. These appointments are open to all students and junior practitioners holding hospital tickets. 4. Assistants in the Pathological Department are appointed by the pathologist.

ROYAL HOSPITAL FOR SICK CHILDREN, Sciennes-road, Edinburgh.—This hospital contains 120 beds, and is fitted with every modern improvement. A fully equipped out-patient department (medical and surgical) is conducted daily in a building adjoining the hospital. Systematic courses of instruction, which qualify for graduation in the Edinburgh University and elsewhere, are given from time to time throughout the year by the staff. Students may enter at any time. Full particulars can be obtained from the Registrar at the hospital.

EYE, EAR, AND THROAT INFIRMARY OF EDINBURGH (with which is incorporated the Edinburgh Eye Dispensary), 6, Cambridge-street, Lothian-road.—Clinical Lectures and Instruction are given in this institution, which is open at 1 o'clock daily for outdoor patients for Eye Diseases; Mondays, Thursdays, and Saturdays at 12 noon, and Tuesdays and Fridays at 4 P.M. for outdoor Ear, Nose, and Throat Patients. Practical Ophthalmoscopic Classes may be arranged, and Clinical Assistants are appointed from time to time. A post-graduate course in Diseases of the Ear, Nose, and Throat is held each academic term, commencing Oct. 16th, Jan. 14th, and May 8th. The class meets at 5 P.M. each Tuesday and Friday, and the instruction, which is essentially practical, is supplemented by lantern demonstrations. Patients whose diseases require operations or more than ordinary care are accommodated in the house. Secretary: Mr. J. P. Watson, W.S., 32, Charlotte-square.

UNIVERSITY OF GLASGOW.

The University of Glasgow is both a teaching and a degree-granting body, but admits to graduation only candidates whose preliminary examination and course of study conform to its own regulations. Within certain limits instruction given by recognised medical schools and teachers may be accepted, but not less than one-half of the subjects other than clinical must be taken in this or some other recognised university, and at least two years of the course must be taken in Glasgow University. Seven degrees, open both to men and women, are conferred: M.B. and Ch.B. (always conjointly), M.D. and Ch.M.; B.Sc. in Public Health; D.Sc. in Public Health; B.Sc. in Pharmacy; and Ph.D. in the Faculty of Medicine.

All information as regards the extent and standard of the Preliminary Examination may be obtained by application to the Secretary, Scottish Universities Entrance Board, 81, North-street, St. Andrews.

For the degrees of M.B. and Ch.B. a curriculum of five years is required. The candidate must, during his curriculum, have attended a course or courses of instruction in each of the following subjects of study, extending over not less than the number of terms specified in each case, and including such class examinations as may be prescribed in connexion with the several courses:—Chemistry (including Organic Chemistry), two terms; with Practical Chemistry, one term; Physics (with practical work), one term; Botany (with practical work), one term; Zoology (with practical work), one term; Anatomy and Practical Anatomy, five terms; Physiology and Practical Physiology, three terms; Materia Medica and Therapeutics (together or separately), each subject, one term; Pathology and Practical Pathology, three terms; Medical Jurisprudence and Public Health (together or separately), each subject, one term; Midwifery and Diseases peculiar to Women and to Infants, two terms; Surgery, two terms; Medicine, two terms. Candidates must attend for at least three years the Medical and Surgical Practice of a recognised hospital accommodating at least 80 patients and having a distinct staff of physicians and surgeons. At least nine months' hospital attendance is required on both Clinical Surgery and Clinical Medicine, and the student must have acted for six months as clerk in medical and dresser in surgical wards, and must have had six months' outdoor practice; he must also have attended a course of Mental Diseases and of Practical Pharmacy (25 meetings), must have been properly instructed in Vaccination at a public vaccination station, and must have attended at least 20 cases of labour and the Practice of a Lying-in Hospital. The University also requires further study in various special subjects.

There are four Professional Examinations, the first comprising Botany, Zoology, Physics, and Chemistry; the second comprising Anatomy and Physiology; the third comprising Materia Medica and Therapeutics and Pathology; and the fourth or final, comprising Medical Jurisprudence and Public Health, Surgery and Clinical Surgery, Practice of Medicine and Clinical Medicine, and Midwifery and the Diseases Peculiar to Women and to Infants.

The degrees of M.D. (*Doctor of Medicine*) *and Ch.M.* (*Master of Surgery*) are higher degrees in Medicine and Surgery respectively, and candidates (not under 24 years of age) who have previously obtained the double bachelorship may be admitted to either M.D. or Ch.M. on completing the after course prescribed, including an examination in Clinical Medicine for M.D. and an examination in Surgical Anatomy, operations on the dead body, and Clinical Surgery for Ch.M.

The higher degree of Doctor of Philosophy (Ph.D.) is also conferred in the Faculty of Medicine. Candidates must already have obtained a degree (or equivalent diploma) from an approved University or College and must prosecute a course of special study or research for two or three years and give evidence of satisfactory progress. A thesis must be presented for approval by the Senate on the recommendation of a Special Committee. The candidate may be required to undergo an oral or other examination on the subject-matter of the thesis.

In 1919 new chairs were instituted in Bacteriology, Organic Chemistry, and Physiological Chemistry.

Fees.—The Fees for M.B. and Ch.B. are £34 13*s.* The class fee in each subject of the curriculum for M.B. and Ch.B. is £3 3*s.*, £4 4*s.*, or £6 6*s.*, and the present fee for hospital attendance is £7. The fee for M.D. is £21, and for Ch.M. £21.

The great majority of the students take their hospital course at the Western, Royal, and Victoria Infirmary, and at the district hospitals of the Glasgow Parish Council, where clinical instruction is given by professors of the University and others. Clinical instruction on Fevers is given at Ruchill and Belvidere Hospitals, while special courses, largely of a practical nature and embracing work in Hospital or Asylum wards, are conducted by University Lecturers on the Ear, the Throat and Nose, Dermatology, Ophthalmology, Venereal Diseases, Tuberculosis, Insanity, and Electro-diagnosis and Therapeutics. Queen Margaret College, sometime conducted as a separate institution for the higher education of women, was made over to the University in 1892, and in it medical classes for women are conducted under University professors and other lecturers appointed by the University Court, whilst for clinical instruction female students mostly attend the Royal Infirmary.

Post-graduate Medical Teaching.—Organised Post-graduate Medical Teaching is now available in Glasgow under the auspices of Glasgow Post-graduate Medical Association. This Association is composed of practically all the Teaching Institutions in Glasgow and the various teachers giving post-graduate instruction, and its business is managed by a Board elected periodically by them. The chairman of the Board is Principal Sir Donald MacAlister, and the vice-chairman Sir Hector C. Cameron. Weekly demonstrations for practitioners are given throughout the winter and spring, and comprehensive courses of instruction during the summer and autumn. Arrangements have also been made whereby a limited number of graduates may become attached to wards or out-patient departments nominally as clinical assistants for definite periods throughout the year. As such they work under the direct supervision of the physician or surgeon in charge, and carry out such detailed investigations as directed. Further information may be obtained from Dr. John N. Cruickshank, Secretary, Post-Graduate Medical Association, University, Glasgow.

In this University Bursaries and Prizes to the annual amount of over £1000 are appropriated to students in the Medical Faculty, and there are also several Scholarships and Fellowships which may be held by medical students who have gone through the Arts course. A full list will be found in the University Calendar.

THE ANDERSON COLLEGE OF MEDICINE, Dumbarton-road, Glasgow, W.—Courses are given which qualify for all the licensing boards and for the Universities of Oxford, Cambridge, London, Durham, Edinburgh, and Glasgow (the latter two under certain conditions). Candidates for the Licence in Dental Surgery can obtain the full medical curriculum in Anatomy, Chemistry, Physiology, Surgery, Practice of Medicine, and Materia Medica. The courses special to Dentistry are conducted at the Dental Hospital, Glasgow.

The buildings are situated in Dumbarton-road, immediately to the west of the entrance to the Western Infirmary, and adjoining the University. Extensive accommodation is provided for Practical Anatomy, Practical Chemistry, Practical Botany, Practical Zoology, Practical Physiology, Practical Pharmacy, Operative Surgery, and Public Health. Ample provision has also been made for the comfort of students.

Women students are admitted on the same terms as men.

The Carnegie Trust extends its benefactions to students of the Anderson College of Medicine. Full particulars may be obtained from Sir W. S. McCormick, the Carnegie Trust Offices, Merchants' Hall, Edinburgh.

Communications relating to the College to be addressed to the Secretary of the Medical Faculty, The Anderson College of Medicine, Glasgow, W. Communications relating to the Preliminary Examination in General Education to be addressed to Mr. Hugh Cameron, M.A., F.E.I.S., Educational Institute Office, 34, North Bridge-street, Edinburgh. Communications relating to the Triple Qualification to be addressed to Mr. Walter Hurst, Royal Faculty Hall, 242, St. Vincent-street, Glasgow.

The Winter Session will open on Monday, Oct. 8th, 1923.

ST. MUNGO'S COLLEGE AND GLASGOW ROYAL INFIRMARY.—The classes in St. Mungo's College qualify for the medical qualifications of the English, Scotch, and Irish Conjoint Boards, for the dental diplomas of the English, Irish, and Scottish Boards and, under certain conditions, for the various universities, including the University of London. Students who have fulfilled the conditions of the Carnegie Trust as regards Scottish birth or extraction, age (16 years), and Preliminary Examination, are eligible for the benefits of this Trust during the whole course of their studies at St. Mungo's College. The classes are open to male and female students equally. The minimum fees for all the lectures, including hospital attendance, necessary for candidates for the Diplomas of the English or Scotch Colleges of Physicians and Surgeons, amount to £120. Further particulars can be obtained from a syllabus which may be procured free on application to the Secretary of the Medical Faculty, 86, Castle-street, Glasgow.

QUEEN MARGARET COLLEGE (Women's Department of the University).—This is an integral part of the University of Glasgow. The classes are taught by professors of the University and other lecturers appointed by the University Court, and it is governed by the University Court and Senate. The curriculum, regulations, and fees are the same as those of the male students, and the University degrees are open to women on the same conditions as to men. They have access to the University Museum and can borrow books from the University Library, besides having a library of reference in Queen Margaret College. The School of Medicine is a special feature of the College, and gives full preparation for the medical degrees of the University. In July, 1894, for the first time in the history of any Scottish University, women students graduated in medicine in Glasgow University. Over 500 women have now taken the degree of M.B., C.M., or M.B., Ch.B. of the University of Glasgow and 30 the degree of M.D. The women students attend classes in the various University Buildings at Gilmore-hill, Queen Margaret College, the Royal Infirmary, the Western Infirmary, and the Victoria Infirmary. Excellent facilities for clinical work are given in the Royal Western and Victoria Infirmaries, in the Maternity, Royal Sick Children's, and other hospitals. The Arthur Scholarship is open every third year to students of first year; other Bursaries are open in Arts and Medicine; and by an ordinance of the Universities Commissioners women are admitted to certain University bursaries, scholarships, and fellowships. The Winter Session will open on Oct. 8th. New students of Medicine will be admitted in April, 1924. Applications for entrance at that date should be made before Feb. 1st, 1924.

ROYAL INFIRMARY, Glasgow.—The ancient connexion between the University of Glasgow and the Royal Infirmary was revived in 1911, when four University Chairs and several University Lectureships were established at the infirmary. St. Mungo's College is situated in the infirmary grounds. The infirmary has, including the Ophthalmic Department, 700 beds. There are special beds and wards for diseases of women, of the throat, nose, and ear, skin, venereal diseases, burns and septic cases. The wards are open to Women Students. At the Out-door Department the attendances in 1922 numbered over 180,000. In addition to the large medical and surgical departments there are departments for special diseases—viz., diseases of women, of the throat and nose, of the ear, of the eye, of the skin, and of the teeth. Five house physicians and 11 house surgeons, who board in the hospital free of charge, are appointed every six months. Clerks and dressers are appointed by the physicians and surgeons. As a large number of cases of acute diseases and accidents of a varied character are received these appointments are very valuable and desirable. There is a modern and fully equipped Electrical Pavilion, and year by year the latest and most approved apparatus for diagnosis and treatment has been added. Post-graduate Classes are held during September in Clinical Medicine, Clinical Surgery, Clinical Gynæcology, Diseases of the Skin, Venereal Disease in the Male, Diseases of the Throat, Nose and Ear, and in Diseases of the Eye. For information regarding fees and other particulars, application should be made to the Superintendent.

GLASGOW WESTERN INFIRMARY.—This hospital adjoins the University of Glasgow. Number of beds upwards of 600. Special wards are set apart for

Diseases of Women, Throat, Nose, and Ear, and for Affections of the Skin. In the out-patient department there are special clinics for Diseases of Women and for Diseases of the Throat, Ear, Teeth, Skin, Venereal Disease, and Electro-therapeutics. The Clinical Courses are given by the physicians and surgeons, each of whom conducts a separate class, and students require to enter their names at the beginning of the session for the class which they propose to attend. Special instruction is given to junior students by tutors or assistants, and clinical clerks and dressers are selected from the members of the class. All the courses of clinical instruction are recognised by the University of Glasgow and the other boards in the kingdom. In the Pathological Department the course is both systematic and practical, also post-graduate courses, and extends through the winter and following summer; these are likewise recognised by the University for graduation. Eighteen resident assistants are appointed annually, without salary, from those who have completed their course. The fees are as follows:—For Infirmary Attendance, Dispensary, &c.: (*a*) For Perpetual Ticket, £12 12*s.*; (*b*) for Single Term Ticket, £1 11*s.* 6*d.* For Courses of Instruction: (*a*) Six Months or Two Terms, £5 5*s.*; (*b*) Three Months or One Term, £2 12*s.* 6*d.* A Clinical Laboratory has been opened, and students receive laboratory instruction from the lecturer on clinical methods. Secretary: J. Matheson Johnston, C.A., 87, Union-street.

A School of Massage, Medical Electricity, and Swedish Remedial Exercises has been established to qualify for the Certificate of the Chartered Society of Massage and Medical Gymnastics.

Royal Hospital for Sick Children, Yorkhill, Glasgow.—This institution, which was founded in 1882, consists of: (1) a hospital at Yorkhill containing 270 cots built on an elevated and central site close to the University and opened in July, 1914; (2) a Dispensary, or Out-patient Department, in West Graham-street, opened in October, 1888; and (3) a country branch at Drumchapel, Dumbartonshire, containing 30 cots, opened in 1903. Children treated must not be over 13 years of age, nor suffer from infectious diseases. At the hospital about 5000 in-patients are treated annually in the wards and about 13,000 out-patients are treated. There are two lectureships in the University of Glasgow in connexion with the hospital, one on the Medical Diseases of Infancy and Childhood, and the other on Surgery and Orthopædics in Relation to Infancy and Childhood. These lectureships are held by the Visiting Physician, Dr. Leonard Findlay, and one of the Visiting Surgeons, Mr. Alex. MacLennan. The lectures are both systematic and clinical, but particularly and chiefly the latter. In addition special facilities are given for post-graduate study. Information with regard to clinical instruction, lectures, demonstrations, post-graduate study, &c., may be obtained from the Med. Superintendent.

The Glasgow Royal Maternity and Women's Hospital, Rottenrow.—The new hospital, which was opened in 1908, is in point of size the largest of its kind in Britain and has accommodation for 108 patients. A Maternity and Child Welfare Centre has been established in connexion with the hospital, consisting of a complete In-door and Out-door Ante-natal Department and an Infant Consultation Clinic. In 1922 4951 normal cases and 2447 abnormal cases were treated by the hospital in the In-door and Out-door Departments. Secretary: Mr. William Guy, 146, Buchanan-street. Full particulars as to fees and accommodation may be obtained from the House Superintendent at the hospital.

Royal Samaritan Hospital for Women, Glasgow.—This hospital, founded in 1886, is the largest purely gynæcological hospital in Great Britain, possessing, as it does, over 90 beds, which will be increased to 160 when building extensions are completed. It offers excellent facilities for clinical instruction in the diseases peculiar to women, treating in the wards and in the out-patient department from 5000 to 6000 cases per annum. Lectures and clinical demonstrations are given by members of the surgical staff to students and to post-graduates; and the hospital is represented on the Board of the Glasgow Post-Graduate Medical Association formed for co-ordinating post-graduate medical teaching in all the hospitals. For further information application may be made at the Hospital, or to T. Mason Macquaker, M.A., B.L., Secretary, 149, St. Vincent-street, Glasgow.

Glasgow Lock Hospital, 41, Rottenrow.—The hospital contains 83 beds. During 1922 373 patients were admitted to the wards; 19,725 visits were made by out-door patients at the dispensary. A Labour Ward has been added. Classes are held for the clinical instruction of medical students. These classes are now compulsory, and 120 students attended last year. There are also post-graduate classes held. J. Neilson Gray, LL.B., secretary and treasurer, 65, Bath-street, Glasgow.

Glasgow Ophthalmic Institution, 126, West Regent-street, and 131, Wellington-street (30 beds and six cots).—Clinical and systematic course of lectures for students during the winter and summer sessions. In-patients, 778; out- or dispensary patients, 12,524; daily average of attendances, 127·5; total attendances, 35,434. Operations on Wednesdays and Saturdays. This institution is administered by the Royal Infirmary. Secretary and Cashier: R. Morrison Smith, C.A., 135, Buchanan-street, Glasgow.

Glasgow Eye Infirmary, Berkeley-street and Charlotte-street.—This institution, the largest of its kind in Scotland, was founded in 1824. The average number of new patients for the last ten years has been 26,229 and the total number of cases in 1922 was 21,872. The wards and dispensary are recognised by the University of Glasgow for the purpose of instruction in ophthalmology for graduation in medicine. A Venereal Centre has been established, and a Branch Dispensary has been opened in Clydebank. Secretary and Acting Treasurer: Harold John Black, 88, West Regent-street, Glasgow. The medical session opens in October. Post-graduate Classes will be held.

Glasgow Hospital for Diseases of the Ear, Nose, and Throat, 27 and 28, Elmbank-crescent.—14 beds. New patients, 6004. Attendances at out-patient department 20,093. Admitted to in-door department 431. Clinical instruction is given in connexion with Dr. Connal's course on Diseases of the Ear at Anderson's College and Dr. Syme's course on Diseases of the Throat and Nose at the Western Medical School. Secretary: D. N. Mackay, 219, St. Vincent-street, Glasgow.

UNIVERSITY OF ST. ANDREWS (UNITED COLLEGE ST. ANDREWS AND UNIVERSITY COLLEGE, DUNDEE).

Four Degrees in Medicine and Surgery are conferred by the University of St. Andrews—viz., Bachelor of Medicine (M.B.), Bachelor of Surgery (Ch.B.), Doctor of Medicine (M.D.), Master of Surgery (Ch.M.), a Diploma in Public Health, and Diploma in Dental Surgery (L.D.S.).

The Preliminary Examination includes (*a*) English, (*b*) Latin, (*c*) Elementary Mathematics, and (*d*) one of the following optional subjects: (α) Greek, (β) French, (γ) German, (δ) Italian, (ε) any other approved modern language. A degree in Arts or in Science in any of the Universities of the United Kingdom and in some colonial and foreign universities shall exempt from the Preliminary Examination. The Preliminary Examination for graduation in Medicine and Surgery, Arts or Science, of the University of St. Andrews is accepted as equivalent to the Registration Examination required by the General Medical Council (the certificate to include the required subjects). Also the Final Examination for a degree in Arts or Science and the Final Examination for the Diploma of LL.A.

Degree of Bachelor of Medicine and Bachelor of Surgery.—A pre-registration examination is held in Physics and Chemistry. Candidates must have been engaged in medical study for at least five years after registering as a medical student. In each of the first four years the candidate must have attended at least two courses of instruction in one or more of the subjects of study specified below, each course extending over a session of not less than five months, either continuous or divided into two terms, or, alternatively, one such course along with two courses, each extending over a session of not less than two and a half months. During the fifth or final year the candidate shall be engaged in clinical study for at least nine months at the Infirmary of Dundee or at one or more of such public hospitals or dispensaries, British or foreign, as may be recognised for the purpose by the University Court. The candidate must have received instruction in each of the following subjects of study, including such examinations as may be prescribed in the various classes—viz.: Anatomy, Practical Anatomy, Chemistry, Materia Medica, Physiology, or Institutes of Medicine, Practice of Medicine, Surgery, Midwifery and the Diseases peculiar to Women and Infants, Pathology, Practical Chemistry, Physics (including the Dynamics of Solids, Liquids, and Gases, and the Rudiments of Sound, Heat, Light, and Electricity), Elementary Botany, Elementary Zoology, Practical Physiology, Practical Pathology, Forensic Medicine, and Public Health. The candidate must have attended for at least three years the Medical and Surgical Practice either of the Infirmary of Dundee or of a General Hospital elsewhere which accommodates not fewer than 80 patients and possesses a distinct staff of physicians and surgeons and is recognised for the purpose by the University Court. Additional subjects of study are Practical Pharmacy, Mental Diseases, Practical Midwifery, Operative Surgery, Vaccination, Children's Diseases, Fevers, Ophthalmology, Diseases of the Ear, Throat, and Nose, Anæsthetics, Dermatology and Post-mortem Examinations.

With respect to the places and institutions at which the studies of the candidate may be prosecuted the following regulations shall have effect:—1. Two of the five years of medical study must be spent in the University of St. Andrews. 2. The remaining three years may be spent in any University of the United Kingdom or in any Indian, Colonial, or Foreign University recognised for the purpose by the University Court, or in such medical schools or under such teachers as may be recognised for the purpose by the University Court. Women are admitted to graduation in Medicine, subject to certain provisions.

Professional Examinations for the Degrees of Bachelor of Medicine and Bachelor of Surgery.—Each candidate will be examined both in writing and orally, and also clinically where the nature of the subject admits, in the following divisions—viz., first, in Botany, Zoology, Physics, and Chemistry; second, in Anatomy and Physiology; third, in Materia Medica and Pathology and Forensic Medicine and Public Health; and fourth, in Surgery, Clinical and Operative Surgery, Practice of Medicine and Clinical Medicine, and Midwifery and Gynæcology (Systematic and Clinical).

The fee to be paid for the degrees of Bachelor of Medicine and Bachelor of Surgery shall be 22 guineas, and the proportion of this sum to be paid by a candidate at each division of the examination shall be regulated from time to time by the University Court. The fee to be paid for the degree of Doctor of Medicine shall be 15 guineas, and for the degree of Master of Surgery 15 guineas. The whole medical curriculum can be taken in University College, Dundee, or the first two years in United College, St. Andrews.

For further particulars and details as to scholarships and bursaries application should be made to Prof. Charteris, Dean of the Medical Faculty, University College, Dundee.

University College, Dundee.—This College is one of the constituent colleges of the University of St. Andrews. In the medical buildings there are spacious and well-equipped laboratories. The complete medical curriculum can be taken in Dundee. For classes, fees, &c., see under University of St. Andrews.

Royal Infirmary, Dundee.—The Infirmary contains 408 beds. In addition to the ordinary Medical and Surgical Wards, there are special departments for Midwifery (In- and Out-door), Diseases of Women, of Children, of Eye, of Ear, Nose and Throat, of Skin Cases, and for Clinical Pathology, Radiology, and Electro-therapeusis. An extension providing for new X Ray and Massage Departments and for additional Operation Theatre accommodation is being constructed at a cost of £20,000. Clinical teaching is given to male and female Students by the Honorary Staff; post-mortem examinations are conducted by the pathologists. All courses of instruction are recognised by the University of St. Andrews and the other Boards of the United Kingdom. Nine Resident Medical Officers are appointed every six months. Clinical clerks and dressers are attached to the Physicians and Surgeons; and Students are appointed as assistants in the pathological department. The fees for Hospital attendance are as follows: For Perpetual Ticket, £12; or if paid in instalments, £12 12*s.*; Ticket for 12 Months, £4 4*s.*; Ticket for 3 Months, £1 11*s.* 6*d.* Further information may be obtained from the Medical Superintendent.

UNIVERSITY OF ABERDEEN.

The University of Aberdeen grants four degrees in Medicine and Surgery—viz., Doctor of Medicine (M.D.), Master of Surgery (Ch.M.), Bachelor of Medicine (M.B.), and Bachelor of Surgery (Ch.B.). The Degree of Doctor of Philosophy (Ph.D.) is also granted in the Faculty of Medicine.

Degrees of M.B. and Ch.B.—Before commencing his medical studies each student must comply with the following regulations: (1) Every Candidate desiring admission to the Faculty of Medicine must be in possession of the necessary "Certificate of Fitness" issued and attested by the Scottish Universities Entrance Board, 81, North-street, St. Andrews. Forms on which to make application for this Certificate may be obtained from the Secretary to the University of Aberdeen. From and after Jan. 1st, 1921, the Regulations contained in the Ordinances for Degrees in Medicine are revoked, and the following General Regulation made by the Entrance Board is substituted therefor, namely: "That (*a*) the Group Certificates of the Scottish Education Department, or (*b*) the evidence of satisfactory completion in Schools in Scotland of a curriculum of Secondary Education, as attested by the said Group Certificates or otherwise, or (*c*) the Leaving or other Certificates accepted as qualifying for admission to the Universities in the case of applicants for admission from outside Scotland, which shall be deemed to entitle applicants for admission to the Universities to enter upon a course of study qualifying for graduation in the Faculty of Medicine, shall be the same as those which, under the Regulations for the time being in force, are deemed to entitle applicants for admission to the Universities to enter upon a course of study qualifying for graduation in the Faculty of Arts or, alternatively, in the Faculty of Science, for Degrees in Pure Science."

Candidates, therefore, before entering on the curriculum for the Degree must: (1) have passed (*a*) the Arts Preliminary Examination, or (*b*) the Science Preliminary Examination, or (2) hold a qualification recognised as exempting from such examination. (3) Have attained the age of 17 years. (4) That they have passed the Pre-registration Examination in Physics and Chemistry.

The following regulations for Pre-registration Courses in Physics and Chemistry have been made by the University of Aberdeen:—

1. Pre-registration Courses in Physics and in Chemistry will be held in the Winter Term and

in the Summer Term. The fee for each course is £2 2*s*.

2. The Senatus Academicus has power to grant exemption from attendance on these courses of instruction to students who have completed courses of instruction in Physics or Chemistry in a Secondary School, Technical or University College, Medical School or University, provided that the courses include practical work.
3. Pre-registration Examinations will be held in Marischal College at the end of the Summer Term, immediately before the commencement and at the end of the Winter Term, and at the end of the Spring Term, or at such other times as the University Court, after consultation with the Senatus Academicus, may determine. The Examination Fee is 10*s*. 6*d*. for each subject.
4. The Senatus has power to grant exemption from the Pre-registration Examination to candidates: (i.) who have passed an Examination in Physics and Chemistry for a Degree in Arts, Science, or Medicine at any University in the United Kingdom, or any other University specially recognised for the purpose by the University Court, or (ii.) who have passed an Examination in these subjects which has been previously specially recognised by the University Court as equivalent to the Examination carried out by the University of Aberdeen.

The curriculum for the degrees extends over a period of five years, during which attendance is required in the following subjects: Botany, Zoology, Physics, Chemistry (Systematic and Practical), Anatomy (Systematic and Practical), Physiology (Systematic and Practical), Materia Medica and Therapeutics, Practical Pharmacy, Pathology (Systematic and Practical), Medical Jurisprudence, Public Health, Surgery, Medicine, and Midwifery.

Candidates must attend for at least three years the medical and surgical practice of a recognised hospital; they must have attended courses of at least nine months in clinical medicine and clinical surgery, and have acted as clerk in the medical and dresser in the surgical wards of a hospital. Attendance is required on the practice of a dispensary or the out-practice of a hospital and also on courses in Mental Diseases, Fevers, Ophthalmology, Post-mortem Examinations, Venereal Diseases, Tuberculosis, and other special subjects. The candidate is also required to have been properly instructed in Vaccination and to have attended at least 20 Midwifery cases.

The cost, including Matriculation, Class, Degree, and Hospital Fees, for the whole curriculum leading to the Degrees of M.B. and Ch.B. is approximately £235.

Besides the Royal Infirmary, students have the opportunity of attending the following institutions: City Fever Hospital, Sick Children's Hospital, General Dispensary, and Lying-in and Vaccine Institutions, Royal Lunatic Asylum, Ophthalmic Institutions, &c.

Degrees of M.D. and Ch.M.—Candidates for either of these degrees must already hold the degrees of M.B. and Ch.B. of Aberdeen. A thesis has to be presented and an examination has to be passed in Clinical Medicine (or in some special Department of Medical Science) or Clinical Surgery, as the case may be.

Degree of Ph.D.—For this degree candidates must pursue a course of special study or research during a period of nine academical terms as Research Students in the University of Aberdeen or in any College or Institution that may be affiliated thereto. A Thesis must be presented for approval. The fee is £10 10*s*.

A diploma in Public Health is granted by the University to graduates in Medicine of a University in the United Kingdom, after a special examination.

Application for further information should be addressed to the Secretary of the Medical Faculty.

Scholarships and Prizes.—In the Faculty of Medicine of the University of Aberdeen there are the following Bursaries, Scholarships, and Prizes:—Bursaries: about 15 Bursaries (competition and presentation) are open each year, of £15 to £30 per annum in value, most of them being tenable for three years. Scholarships: five Post-Graduate Scholarships, value £36 to £160 per annum. Prizes and Medals: 13 Gold Medals and Prizes for proficiency in special departments, &c.

Clinical Instruction is given in the Aberdeen Royal Infirmary (270 beds) by the physicians and surgeons on the staff.

ABERDEEN ROYAL MENTAL HOSPITAL.—Contains, with hospital attached to main institution and agricultural branch, about 950 beds. Clinical instruction is given to students during three months in summer. Clerk and Treasurer, Mr. A. Scott Finnie, 343, Union-street, Aberdeen.

SCOTTISH MEDICAL CORPORATIONS GRANTING DIPLOMAS.

SCOTTISH CONJOINT BOARD.

ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH, ROYAL COLLEGE OF SURGEONS OF EDINBURGH, ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW.

These Colleges have made arrangements by which, after one series of examinations, held in Edinburgh or Glasgow, or both, the student may obtain the diplomas of the three Bodies.

The three Bodies grant their Single Licences only to candidates who already possess legal qualifications in Medicine or Surgery. Copies of the Regulations for the Single Licence of any of the Bodies may be had on application to the respective secretaries.

Professional Education.—The candidate must produce certificates or other satisfactory evidence of having attended the following separate and distinct courses of instruction: Physics, three months; Elementary Biology, three months; Chemistry, six months; Practical or Analytical Chemistry, three months; Anatomy, during at least six months; Practical Anatomy, twelve months; Physiology, six months; Practical Physiology, three months; Materia Medica, three months; Pathology (including Practical Pathology), nine months; Practice of Medicine, six months; Clinical Medicine, nine months; Principles and Practice of Surgery, six months; Clinical Surgery, nine months; Midwifery, three months; Gynæcology, one course of not less than 13 meetings; Diseases of Children, one course of not less than 13 meetings; Medical Jurisprudence and Public Health, three months. The certified attendance on lectures, demonstrations, and practical work must not be less than three-fourths of the total number of roll-calls. Every student undergoes a course of Practical Midwifery, but before attending at labours he is required to attend a course of lectures on Surgery and Midwifery and to hold the offices of Clinical Medical Clerk and Surgical Dresser. He must also attend for two and a half months instruction in Practical Pharmacy; the certificate to be signed by the teacher, who must be a member of the Pharmaceutical Society of Great Britain, or the superintendent of the laboratory of a public hospital or dispensary, or a registered practitioner who dispenses medicines to his patients, or a teacher of a class of Practical Pharmacy.

The student must attend for 27 months the Medical and Surgical practice of a public general hospital containing on an average at least 80 patients available for clinical instruction and possessing distinct staffs of physicians and of surgeons. He must act as Surgical Dresser and Medical Clinical Clerk for not less than six months in the wards in each case, and receive practical instruction in administration of anæsthetics. He must attend for six months the practice of a public dispensary especially recognised by any of the above authorities, or the out-patient practice of a recognised general hospital or act for six months as pupil to a registered practitioner who either holds such a public appointment, or has such opportunities of imparting practical knowledge as shall be satisfactory to the coöperating authorities; this attendance should be made after the student has passed the First and Second examinations.

Candidates are also required to attend the following courses: Diseases and Injuries of the Eye, three months; Insanity, three months; Infectious Diseases, three months; Gynæcology, three months; Diseases of Children, three months.

The curriculum lasts for five years, the fifth year being devoted to clinical work.

There are four professional examinations:—

First Examination includes Physics, Chemistry, and Elementary Biology.

Second Examination includes Anatomy and Physiology and Histology; and candidates may be admitted to this examination at the end of the second year of medical study.

Third Examination includes Pathology and Materia Medica with Pharmacology.

Final Examination.—The Final examination shall not be taken earlier than the end of the fifth year of study and shall embrace the following subjects:—Medicine, including Therapeutics, Medical Anatomy, and Clinical Medicine; Surgery, including Surgical Anatomy, Clinical Surgery, and Diseases and Injuries of the Eye; Midwifery and Diseases of Women; and, if not passed previously, Medical Jurisprudence and Public Health, but it is optional to candidates who have passed the Third Examination to be admitted to the subject of Medical Jurisprudence and Public Health on lodging certificates of having attended the necessary course in that subject at any time; but the subjects of Medicine, Surgery, and Midwifery shall be taken together at any time after the end of the fifth Winter Session, provided that a period of 24 months has elapsed since passing the Second Examination. All candidates shall be subjected, in addition to the written and oral examinations, to clinical examinations in Medicine and Surgery, which shall include the Examination of Patients, Physical Diagnosis, the Clinical use of the Microscope, Examination of the Urine and Urinary Deposits, Surgical Appliances, Bandages, Surface Markings, &c. The fees payable for the Final Examination shall be—for the whole examination, £15, for re-entry after rejection, £5, and for the subjects of Medical Jurisprudence and Public Health when taken separately, £5, with £3 for re-entry in that subject.

There are four periods of examination annually: During the ensuing period thrice in Edinburgh and once in Glasgow, in 1923–24. The Registrar in Edinburgh is Mr. D. L. Eadie, 49, Lauriston-place, and the Registrar in Glasgow, Mr. Walter Hurst, 242, St. Vincent-street, to whom fees and certificates must be sent for the respective examinations, and from whom further particulars concerning fees can be obtained.

For students registered with the General Medical Council after Jan. 1st, 1923, more extensive Regulations are in force, and candidates applying for Regulations should state date of registration.

ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH: THE MEMBERSHIP AND FELLOWSHIP.

In addition to the diplomas granted by the Scottish Conjoint Board the Royal College of Physicians grants its Single Licence to candidates already possessing legal qualifications for professional practice.

The Royal College of Physicians of Edinburgh grants a *Membership* and a *Fellowship.*

Membership.—A candidate, who must be a Licentiate of a British or Irish College of Physicians, or a graduate in medicine of a University, approved by the Council, and 24 years of age, is examined in medicine, therapeutics, and in any branch of the departments of medicine specially professed, such as general pathology, psychology, public health, obstetrics, gynæcology, diseases of children, tropical medicine, or medical jurisprudence. The fee for the Membership is £36 15*s.*, 15 guineas of which will be returned to any successful candidate who was already a Licentiate of the College at the time of qualifying for the Membership.

Fellowship.—The Fellows are selected from the ranks of the *Members.* The fee is £64 18*s.*

ROYAL COLLEGE OF SURGEONS OF EDINBURGH: THE FELLOWSHIP.

The Royal College of Surgeons of Edinburgh also admits to the examination for its Single Licence any candidates who hold a Diploma in Medicine of any British, Indian, or Foreign university or of any British College of Physicians, or of the Society of Apothecaries of London or Apothecaries' Hall, Dublin, granted under the provisions of the Medical Act, 1886, whose preliminary examination and course of professional study is proved to be sufficient to fulfil the requirements of the College, or to those who have passed a full examination for any of the above. Female practitioners are admitted to the Licence of the College and also to the Fellowship, and the regulations apply to practitioners of either sex.

The Royal College of Surgeons of Edinburgh grants a diploma of Fellowship after examination to the holders of the surgical degrees of diplomas of such British examining bodies, as well as of the holders of such surgical degrees of the Universities of Canada, Australia, New Zealand, and the Indian Empire as are recognised by the College.

The Fellowship.—Candidates for the examination must be 25 years of age and must have been engaged in practice for at least two years. The examination is of a practical nature, partly written and partly vivâ voce, and must include surgery and surgical anatomy, operative surgery, and clinical practice. One optional subject must also be taken, the range of these specialisms covering nearly every branch of medicine. The fee to be paid on entering for examination for Fellowship is £45, £10 of which is remitted to those who already hold the Licentiateship of the College. Candidates rejected at the examination obtain repayment of fee less £10 retained for examination expenses. One month's notice of intention to appear for examination must be given by the candidate to Mr. D. L. Eadie, 49, Lauriston-place, Edinburgh, clerk to the College, together with credentials signed by two Fellows of the College, one of whom must be a resident in Edinburgh, otherwise a special application, with six testimonials, must be made to the President and the Council of the College.

THE ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW.

Like the preceding corporations, the Royal Faculty of Physicians and Surgeons of Glasgow grants a Fellowship and a Licence to be held as separate qualifications.

Fellowship.—The Fellowship of the Faculty is granted after examination in medicine or surgery, together with an optional subject, which may be anatomy or physiology or be selected from any special branch of medicine or surgery. Fourteen days' notice must be given by the candidate of his intention to present himself to Mr. Walter Hurst, the Faculty Hall, 242, St. Vincent-street, Glasgow. The fee for the Fellowship is £30, £10 of which sum are returned to any successful candidate who already holds the Licence of the Faculty. An additional sum of £20 is required in the case of candidates resident within seven miles of Glasgow. In certain circumstances Fellows may be elected as a mark of distinction.

Licence.—The Licence of the Royal Faculty is granted as a separate qualification to qualified practitioners in Medicine after examination in surgery, including surgical anatomy and clinical surgery. The fee is 15 guineas.

SCOTTISH PROVINCIAL ANCILLARY SCHOOLS AND HOSPITALS.

The hospitals which are recognised by the Scottish Conjoint Board, as places where professional study for their diplomas can be pursued are all those institutions which feed the medical faculties of the universities. In addition the Scottish Boards recognise all the places which are recognised by the English Conjoint Board (see p. 390) and the Irish Conjoint Board (see p. 411).

III.—IRELAND.

THE UNIVERSITIES.

UNIVERSITY OF DUBLIN, TRINITY COLLEGE (SCHOOL OF PHYSIC).

Matriculation.—In order to join the School of Physic students pass a matriculation examination. University students take the Entrance of Trinity College and a Junior Freshman Term or a special Medical Preliminary; Extern Students, any examination recognised by the General Medical Council. The winter courses begin on Oct. 2nd.

Degrees in Medicine (*M.B.*), *Surgery* (*B.Ch.*), *and Midwifery* (*B.A.O.*).—Candidates for these degrees must be of B.A. standing and must be for at least five academic years on the books of the Medical School, reckoned from the date of matriculation. The Arts course may be taken concurrently with the Medical course, and the B.A. degree need not be taken before the final medical examinations, but the Medical degrees are not conferred without the Arts degree. The following courses must be attended:—(1) Lectures—Botany, Zoology, Physics and Practical Physics, Systematic, Descriptive and Applied Anatomy, Chemistry and Practical Chemistry, Histology, Physiology and Practical Physiology, Practice of Medicine, Midwifery and Gynæcology, Pathology and Bacteriology, Materia Medica and Therapeutics, Medical Jurisprudence and Hygiene, Surgery and Operative Surgery; (2) three courses of nine months' attendance on the Clinical Lectures of Sir Patrick Dun's or other recognised Hospital; (3) Practical Vaccination, one month's instruction; (4) Mental Disease, three months; (5) Practical Midwifery with Clinical Lectures, including not less than 20 personally conducted cases, six months; (6) Ophthalmic Surgery, three months. Three groups of examinations have to be passed. Preliminary Scientific Examination, including Physics and Chemistry, Botany, and Zoology. The Intermediate Medical, Part I., including Anatomy, Physiology, and Organic Chemistry, and Part II., including Applied Anatomy and Applied Physiology; and the Final Examination, which is divided into Part I., Materia Medica, Hygiene and Jurisprudence, and Pathology and Bacteriology; and Part II., Medicine, including Clinical, Surgery, including Operations, Midwifery and Gynæcology, Mental Diseases, and Clinical Ophthalmology. Part I. may be passed in the fourth year and Part II. completed at the end of the fifth year.

Doctor in Medicine.—A Doctor in Medicine must have passed all the qualifying examinations and must be a B.A. of three years' standing. He must also read and discuss a thesis before the Regius Professor of Physic.

Master in Surgery.—A Master in Surgery must be a Bachelor in Surgery of the University of Dublin of not less than three years' standing, and must produce satisfactory evidence of having been engaged for not less than two years from the date of his registration in the study, or study and practice, of his profession. He must then pass a special examination.

Master in Obstetric Science.—A Master in Obstetric Science must be a Bachelor in Obstetric Science of two years' standing and must produce evidence of having been engaged in the study of Obstetric Medicine and Surgery during two years. He is then required to pass a special examination.

Diploma in Gynæcology and Obstetrics.—A post-graduate diploma is conferred upon registered medical practitioners who take a six months' course at the Rotunda Hospital, a six months' course in Trinity College, and then pass a special examination.

Bachelor in Dental Science and Master in Dental Science.—The regulations under which these degrees are awarded can be obtained by application to the Registrar of the School of Physic.

All Degrees and Courses of Instruction are open to women students.

Clinical Instruction.—The hospital facilities for clinical instruction available in Dublin will be described below.

NATIONAL UNIVERSITY OF IRELAND.

Matriculation.—All students intending to proceed to the medical degree of the University of Ireland must pass a matriculation examination, the examination taking place in June and September in Dublin and at certain local centres. All students must pass in five subjects (three of which must be Irish, English, and mathematics). All students must pass in Irish except students not born in Ireland, and other students whose home residence shall have been outside Ireland during the three years immediately preceding their matriculation; but all such students will be expected to attend a course of instruction in Irish Literature and History prior to obtaining any degree in the University. The following are the subjects for examination:—1. Irish. 2. Latin or Greek. 3. French, German, Italian, Spanish, Portuguese, Welsh, or any other modern language approved by the Senate. 4. English. 5. Mathematics. 6. Latin, Greek, French, German, Welsh, Spanish, Italian, Portuguese, or any other modern language approved by the Senate, History and Geography (*as a composite subject*), Natural Philosophy, or Physics as an alternative, Chemistry, Botany, and for women candidates only, Physiology and Hygiene. Candidates who, under the regulations are exempted from the necessity of presenting Irish as one of their subjects, may present as their fifth subject either a second language or a second science subject. Students entering for degrees in Medicine or Dentistry, if already registered by the General Medical Council, may be accepted as matriculated students of the Faculty of Medicine on passing the matriculation examination in any faculty of the University.

The medical degrees granted are:—

M.B., B.Ch., and B.A.O.; and M.D., M.Ch., and M.A.O., Ph.D.—Printed forms of application for admission to any medical examination may be had from "The Registrar, The National University of Ireland, Dublin."

The Constituent Colleges of the National University of Ireland at which the full curriculum for medical degrees can be obtained are University College, Dublin; University College, Cork; and University College, Galway.

UNIVERSITY COLLEGE, DUBLIN.—The University and the College were created by the Irish University Act, 1908, and by Charters issued in December, 1908. Former students of the Cecilia-street School of Medicine who graduated in the Royal University may become graduate members of the new College. The constitution of the College, like that of the Constituent Colleges of Cork and Galway, provides for a governing body, an academic council consisting of professors and coöpted lecturers, a body of graduate members, and a body of student members matriculated in the University. The first professors and lecturers were appointed by the Dublin Commissioners Irish Universities Act, 1908.

Matriculation.—Almost all the students of the College are matriculated students of the National University of Ireland.

Universities Examinations in Medicine.—The First Examination includes Applied Physics, Applied Chemistry, Botany, Zoology, and Applied Biology. The examination may be taken in two parts: Part I., Physics and Chemistry; Part II., Botany and Zoology. Honours may be obtained only when both parts are taken as one examination. The Second Examination includes Anatomy and Physiology. Both must be passed at the same time. The Third Examination includes Pathology, Medical Jurisprudence and Hygiene, and Materia Medica.

Degrees of M.B., B.Ch., and B.A.O.—The Examination in Medicine, Midwifery, Surgery, and Ophthalmology includes both the theoretical and the clinical branches. No student can enter for the M.B., B.Ch., or B.A.O. until the end of the fifth year when the curriculum has been completed. The course of study is as follows:—First year.—Winter: Anatomy and Practical Anatomy (required for the Second Examination), Applied Chemistry, Materia Medica and Pharmacology, Applied Anatomy and Physiology, Practical and Applied Physics (with Laboratory Course). Summer: In addition, Applied Biology, Anatomy, and Physiology. Second Year.—Winter: Anatomy, Practical Anatomy, Physiology, and Practical Physiology (physical and chemical). Summer: Anatomy, Practical Anatomy, Physiology, and Practical Histology. Third year.—Winter: Pathology, Surgery, Materia Medica and Pharmacology, Applied Anatomy and Physiology, and Pharmacy. Summer: Materia Medica and Therapeutics, and Practical Pathology. Candidates are also required to attend a General Hospital for nine months (winter and summer). Fourth year, or fourth and fifth years.—Medicine, Medical Jurisprudence and Hygiene, Midwifery and Gynæcology, Operative Surgery, Therapeutics, Applied Anatomy, and Ophthalmology and Otology. Candidates are also required to attend a General Hospital for nine months (winter and summer), and to take instruction in Vaccination, and three months Fever Hospital. Fifth year.—If the Academic (Collegiate) Courses are taken as above, the Courses of the fifth year will be the following: Hospital Attendance, General Hospital, nine months; Clinical Ophthalmology and Otology, three months; Practical Midwifery and Gynæcology, six months; Mental Diseases, to be attended at a Lunatic Asylum, three months. (*Note.*—Practical Midwifery and Gynæcology may be taken in the fourth year after the Systematic Course of Midwifery, but it must not be taken concurrently with the period of attendance at Fever Hospital.) The degree of M.D. may be obtained either by examination or on published work.

Fees.—The fees for Courses may be obtained on application to the Registrar for the College publications.

Information concerning these, and the numerous scholarships and exhibitions of the College can be obtained from the Dean of the Faculty, Prof. E. P. McLoughlin.

UNIVERSITY COLLEGE, CORK: THE SCHOOL OF MEDICINE.—The building is provided with a very large, well-ventilated dissecting room supplied with electric light, with physiological, toxicological, pathological and pharmaceutical laboratories, materia medica, anatomical and pathological museums, as well as a collection of surgical and obstetrical instruments and appliances. There are well-appointed physical, chemical, and biological laboratories, and a large natural history museum in the adjoining building, and part of the College ground is laid out as a botanical garden. The plant houses are well filled with plants and are open to the students in the class of Botany. The Library contains about 70,000 volumes and is open daily during term time to students. The Medical Museum occupies a large room erected at the northern end of the medical buildings. There are Students' Clubs for men and women students of the College and various athletic clubs, the last of these holding a public meeting once in each year in the Mardyke grounds.

All students who have been admitted as matriculated students are required to attend before the President and sign the Roll of Matriculated Students. Students who are candidates for degrees in the National University of Ireland must have passed the Matriculation Examination of that University or other recognised examination, and medical students must have passed a preliminary examination recognised by the General Medical Council. For information as to the conditions and courses of the Matriculation Examination application may be made to the Registrar, National University, Dublin.

Admission of Medical Students.—Students in the Faculty of Medicine who have passed the First Professional Examination of the Conjoint Examinations of the Royal College of Physicians and the Royal College of Surgeons in Ireland, or of the Royal College of Physicians and Royal College of Surgeons of Edinburgh and the Faculty of Physicians and Surgeons of Glasgow, or of the Royal College of Physicians, London, and Royal College of Surgeons, England, may be admitted to the rank of second-year students on making application to the Council and submitting a certificate of having passed the examination. Similarly, students who have passed the Second Professional Examination of the same Colleges may be admitted to the rank of third-year students; and those who have passed the Third Professional Examination of the Dublin Colleges, or of the Edinburgh Colleges and Glasgow Faculties, may be admitted to the rank of fourth-year students.

Residence of Students.—There is no accommodation for the residence of students within the College, but students not living at home, or with relatives or friends, sanctioned by their parents or guardians, are required to live in a hostel or in recognised lodgings, a list of which can be obtained from the Secretary. All students are required to register their addresses each session in the book kept for that purpose in the hall porter's office, and to notify immediately to the Registrar any change of address during the session. The Honan Hostel, adjoining the College, is equipped by private endowment. A number of sets of rooms, together with recreation and common rooms, are provided for lay students who may desire to live there. For full particulars apply to the Warden. The Ursuline Convent, Blackrock, has a house of residence, quite separate from their Secondary School, for Catholic women students.

Clinical Instruction.—Students may attend the South Infirmary, Cork North Charitable Infirmary, the Mercy Hospital, the Cork District Lunatic Asylum, the Victoria Hospital for Diseases of Women and Children, the County Lying-in Hospital, the Cork Maternity, the Cork Fever Hospital, the Cork District Hospital, and the Cork Ear, Eye, and Throat Hospital.

Complete information with regard to class fees, scholarships, and prizes can be obtained from the Dean of the Medical Faculty, Professor A. E. Moore.

South Charitable Infirmary and County of Cork General Hospital (100 beds).—Clinical instruction is given daily in the wards. Special instruction on Diseases of Women and Children will be given in the special wards for such cases. Fee for nine months, £12 12*s.*; for six months, £8 8*s.*; for three months, £4 4*s.* Two resident pupils will be appointed by competitive examination.

Cork North Charitable Infirmary and County and City of Cork General Hospital (112 beds).—Clinical instruction is given daily in the wards by the physicians and surgeons. Special instruction is given to Junior students on two days weekly. Fee for perpetual ticket, £22 1*s.*; for 12 or nine months, £9 9*s.*; for six months, £5 5*s.*; and for three months, £3 3*s.* Two resident pupils are appointed quarterly by the medical staff. All resident pupils are required to be registered pupils of the hospital. There is a special department for treatment of the eye, ear, throat, and nose, and a special dental department. The hospital contains a fully equipped Pathological Department, and a large and extensive X ray Department has recently been added.

Mercy Hospital.—This hospital contains 130 beds (temporary addition to 160) for medical and surgical cases. There is also a daily extern for medical and surgical cases, as well as for diseases of the eye, ear, and throat. Extern medical and surgical, also eye, ear, and throat attendances for 1922, 29,762: intern patients, 1733. Total extern, 29,762. Daily average, 133·6. Two resident students. Honorary Secretary to the Staff: Dr. D. J. O'Connor.

Cork Mental Hospital (Psychological Medicine).—A course of Clinical Lectures on Mental Disease and Allied Neuroses will be delivered by the Resident Medical Superintendent in the Cork Mental Hospital as soon as possible after the opening of the Trinity Term. All Students wishing to enter for the course are expected to attend at the Asylum about that time. The lectures will comprise the general consideration of Insanity in its social and medical aspects, Statistics, Classification, Ætiology, Symptomatology, Diagnosis, Prognosis, Pathology and Treatment. The course will be illustrated by typical cases of the various forms of mental affections. For further particulars apply to Dr. Owen F. McCarthy, Resident Medical Superintendent.

Victoria Hospital (*Incorporated*) (Cork).—There are 75 beds. Clinical instruction on Diseases Peculiar to Children is given. The extern department is open daily at 9.30.

County and City of Cork Lying-in Hospital (Erinville, Western-road; founded 1798).—This hospital contains 22 beds, an Extern Midwifery Department, Gynæcological Department, Extern Department for Women, and Child Welfare Centre. Training Centre for Midwives, preparing for C.M.B. examinations. Fee for six months' attendance, including clinical lectures, £5 5*s*. For further particulars apply to Lucy E. Smith, M.D., secretary to staff.

Cork Maternity (Batchelor's Quay).—Three resident pupils are taken into the Maternity. Poor women are attended at their own homes and there are 8 intern beds. A Child Welfare Centre and Clinic was established in 1919. Clinical lectures are delivered during the session. There is an extern department for the treatment of women's and children's diseases. Fee for attendance at clinical lectures and certificate, £5 5*s*. Honorary secretary to staff, Dr. Henry Corby.

Cork Fever Hospital.—Upwards of 500 cases of various forms of fever and zymotic disease are treated yearly in this hospital. The Resident Medical Officer gives instruction in Practical Pharmacy, a certificate of which is necessary for the National University and Colleges of Physicians and Surgeons of Edinburgh.

Cork District Hospital (Douglas-road; 1200 beds).—This hospital includes special buildings for fever and other infectious diseases (100 beds); for children's diseases (100 beds); and a Lock hospital, the only one in the South of Ireland (80 beds). It affords an extensive field for the study of all classes of diseases, acute and chronic, including special departments for gynæcology and diseases of the skin and nervous system. The physicians and surgeons visit the hospitals every morning at 10 o'clock. Lectures and clinical instruction are given daily in the wards by the physicians and surgeons. Further particulars may be obtained from Dr. W. E. Ashley Cummins, 17, St. Patrick's-place, honorary secretary, medical staff.

Cork Eye, Ear, and Throat Hospital (Western-road).—This hospital is open to students attending the University College and others. Certificates of attendance for three or six months can be obtained. The hospital contains 35 beds. Over 3000 cases are treated during the year. A course of lectures is delivered during the session; also a post-graduate course of instruction. For further information apply to Dr. Arthur Sandford, Eye, Ear and Throat Hospital.

University College, Galway: School of Medicine.—The College contains a well-lighted and ventilated dissecting room and an anatomical lecture theatre; physiological, pathological, pharmaceutical, chemical, and physical laboratories; anatomical, pathological, gynæcological, and materia medica museums; as well as large natural history and geological museums and an extensive library in which students can read and from which they can borrow books. There are 12 Entrance Scholarships, value £25 each, for which Medical Students compete with other students on the Entrance Course. In the Second, Third, and Fourth years three Scholarships in each year, value £25 each, are reserved for Medical Students. Exhibitions of £10 and £5 are awarded on results of 1st, 2nd, 3rd, and Degree Examinations in Medicine. H. H. Stewart Scholarships (£10 a year for three years) are awarded by the University in Anatomy and Physiology at Second Medical Examination amongst Students of the three constituent Colleges. Travelling Studentships (£200 a year for two years) are offered by the University for competition amongst Medical Graduates of the three Colleges of not more than two years' standing. Women students are eligible for all College and University Degrees, Distinctions, and Prizes. There are extensive grounds, a portion of which is occupied by a Botanic Garden and a portion is at the disposal of the College Athletic Union. There are several student societies in the College, including a Biological Society. There are abundant facilities for research and Post-graduate work in the Chemistry, Physiology, and Pathology departments. There are ample facilities for Women Students. Further information can be obtained from the Registrar of the College.

Clinical Instruction is given in the Galway Hospital and in the Galway Union and Fever Hospitals, containing on an average 200 patients.

Galway Union and Fever Hospitals (150 beds).—Clinical instruction is given in these hospitals to the Medical Students of University College, Galway. The regulations for Scholarships tenable in the College, and the regulations for degrees and for courses can be obtained from Messrs. O'Gorman and Co., Galway.

Central Hospital, Galway, Prospect Hill Branch (62 beds).—Founded by Act of Parliament.

QUEEN'S UNIVERSITY OF BELFAST.

There are six degrees in the Faculty of Medicine of the University—viz., Bachelor of Medicine (M.B.), Bachelor of Surgery (B.Ch.), Bachelor of Obstetrics (B.A.O.), Doctor of Medicine (M.D.), Master of Surgery (M.Ch.), and Master of Obstetrics (M.A.O.), The University also grants a Diploma in Public Health, particulars of which will be found in the University Calendar. The degrees of M.B., B.Ch., and B.A.O. are the primary degrees in the Faculty of Medicine, and are conferred at the same time and after the same course of study. No student is admitted to the final examination for these degrees until he has shown: (1) that he is a matriculated student of the University; (2) that he has completed the prescribed course of study in the Faculty of Medicine extending over a period of not less than five academic years from the date of his registration as a student of Medicine by the General Council of Medical Education and Registration of the United Kingdom; (3) that he has passed the several examinations prescribed; (4) that he has attended in the University during three academic years at least the courses of study prescribed for such degrees (the Senate may accept, for not more than two academic years of the required five, courses of study pursued in any other University or School of Medicine approved by the Senate); and (5) that he has attained the age of 21 years. Every candidate for admission as a matriculated student of the University shall pass such Matriculation Examination or fulfil such other test of fitness as may be prescribed by the Senate, which may prescribe the conditions under which students who have passed the Matriculation or Entrance

Examination of any other University or College approved for that purpose (or who have fulfilled such other test of fitness as may be prescribed) may be exempted from passing the Matriculation Examination of the University. For information as to Scholarships and Prizes inquiry should be made of the Secretary of the University.

Primary Degrees of M.B., B.Ch., B.A.O.—All candidates for these degrees must satisfy the examiners in the subjects of four examinations known as the First, Second, Third, and Fourth Medical Examinations respectively.

The First Medical Examination.—The subjects of this examination are Chemistry (Inorganic and Organic), Experimental Physics, Botany and Zoology. The examination will be divided into two parts which may be taken separately: I., Chemistry and Physics; II., Botany and Zoology.

The Second Medical Examination.—The subjects are Anatomy and Practical Anatomy, Physiology and Practical Physiology. Candidates who have previously passed the First Medical Examination may present themselves for this examination at the close of their second year.

The Third Medical Examination.—The subjects are: (1) Pathology and Practical Pathology; (2) Materia Medica, Pharmacology and Therapeutics; (3) Medical Jurisprudence; (4) Hygiene. Candidates who have previously passed the Second Medical Examination may present themselves for this examination at the close of the third year. Attendance on a course in any subject of the Third Medical Examination shall not entitle a student to a certificate of attendance unless he has previously passed in all the subjects of the First Medical Examination.

The Fourth Medical Examination.—The subjects are: (1) Medicine; (2) Surgery; (3) Midwifery; (4) Ophthalmology and Otology. This examination may be taken in two parts: I., Systematic; II., Clinical, Practical and Oral. Candidates who have previously passed the Third Examination may present themselves for Part I. of the Fourth Examination at the close of the fourth year, provided that they have fulfilled the necessary requirements as to attendance, &c., on the courses of instruction in the subjects of examination. Candidates who have passed Part I. of this examination may present themselves for Part II. at the close of the fifth year, provided that they have fulfilled the necessary requirements as to hospital attendance on the various clinical courses in the subjects of examination. Parts I. and II. may be taken together at the close of the fifth year. Attendance on a course in any subject of the Fourth Medical Examination shall not entitle a student to a certificate of attendance unless he has previously passed in all the subjects of the Second Medical Examination.

Degrees of M.D., M.Ch., and M.A.O.—These degrees are not conferred until the expiration of at least three academic years, or in the case of graduates of the University in Arts or Science of at least two academic years, after admission to the primary degrees in the Faculty of Medicine. Every candidate must show that in the interval he has pursued such courses of study, or been engaged in such practical work as may be prescribed. These degrees may be conferred by the Senate either (*a*) after an examination, which includes written, oral, clinical, and practical examinations; or (*b*) on the submission of a thesis or other evidence of original study or research, to be approved by the Faculty of Medicine after an oral or other examination of the candidate on the subject thereof.

The Medical School.—The Donald Currie Chemical Buildings contain a lecture theatre, a preparation room, a chemical museum, a large class-room for elementary practical chemistry, laboratories for qualitative and quantitative analysis, rooms for water and gas analysis, dark room for photographic purposes and balance room, provided with all modern appliances. The Anatomical Department contains a large and well-lighted dissecting-room, a lecture-room, a professor's and demonstrator's room, a bone-room, and a laboratory for microscopic and photographic work. The Medical Museum is in the same building. The Jaffé Laboratories for Physiology comprise a lecture theatre, laboratories for practical work in chemical physiology, histology, and experimental physiology, and in addition small private research rooms, including balance, galvanometer, and centrifuge rooms. The Musgrave Pathological Laboratory. —In this department opportunity is afforded for research in pathology and bacteriology. The department is in touch with most of the hospitals in Belfast, and there is an ample supply of material for investigation by graduates in morbid histology, clinical pathology, and the bacteriology of infectious diseases. A course in pathology or bacteriology is given to graduates, and members of this class have an opportunity of seeing the methods employed in the various investigations carried out in the department for the Public Health Committee of the corporation in connexion with water-supply, sewage disposal, meat- and milk-supply, the diagnosis of cases of infectious diseases, &c. The certificate issued to members of the class in bacteriology qualifies for the D.P.H. degree. The Pharmaceutical Laboratory is fitted and equipped for the work of practically instructing students in the compounding and dispensing of medicines.

Clinical Instruction.—The following institutions are recognised by the University as affording proper opportunities for clinical instruction: the Royal Victoria Hospital, the Mater Infirmorum Hospital, the Union Hospitals, the Belfast Hospital for Sick Children, the Belfast Maternity, the Ulster Hospital for Women and Children, the Ulster Eye, Ear, and Throat Hospital, the Belfast Ophthalmic Hospital, the Purdysburn Fever Hospital, and the Belfast District Lunatic Asylum.

Royal Victoria Hospital, Belfast (350 beds).—Students eligible for McGrath, McQuitty, Malcolm, and Coulter Scholarships aggregate annual value £170. Ten House Surgeons and House Physicians. 36 resident pupilships, three months each, annually for Senior Students, of which a proportion is allotted to Women Students. Special Departments for Radiology, Clinical Pathology, V.D., Dermatology, Gynæcology, Vaccine Therapy, Electro-cardiography.

Mater Infirmorum Hospital (220 beds).—Hon. Secretary Medical Staff: Mr. J. B. Moore.

Belfast Infirmary and Hospital (1600 beds).—Clinical courses are given biennially, and course for D.P.H. in Hospital. Intern Venereal Clinic in Infirmary under Corporation scheme. Maternity Hospital recognised for Practical Midwifery training. Particulars may be obtained on application, as to classes, to Dr. McLiesh. Certificate of vaccination class recognised by Local Government Board.

Belfast Hospital for Sick Children, Queen-street.—Clinical instruction is given in this hospital. During the Winter Session two Courses of Lectures are delivered on the Medical and Surgical Diseases incidental to Infancy and Childhood. Demonstrations in Ophthalmology and Pathology are given, and ample opportunities are afforded in the wards (which contain 45 beds), and in the Out-patient Department, which is largely attended, for gaining a practical and theoretical knowledge of the diseases of Infancy and Childhood. This Hospital grants Certificates in Diseases of Children, which are recognised by the various Examining Bodies. A Gold Medal is offered for competition at the close of the session. Fee for the session—2 guineas. For re-attendance—1 guinea. Hon. Secretary to the Medical Staff, Dr. Rowland Hill.

Maternity Hospital, Townsend-street, Belfast.—25 beds in constant occupation, and exclusively devoted to Midwifery and Ante-natal conditions. There is also a large district. Students are welcomed, and clinical lectures are delivered daily by a member of the Staff. There is also a large Ante-Natal Department where clinical instruction is given twice weekly. The Hon. Secretary of the Medical Staff is H. L. Hardy Greer, F.R.C.S.

Ulster Hospital for Children and Women, Templemore-avenue, Belfast (48 beds).—Clinical instruction to students in Diseases of Children, Gynæcology, and Obstetrics. Special departments: Radiology and Eye, Ear, and Throat. Gold Medal awarded annually. One House Surgeon appointed from students of hospital.

Benn Ulster Eye, Ear and Throat Hospital, Incorporated, Clifton-street, Belfast (30 beds).

Belfast Ophthalmic Hospital, Great Victoria-street (30 beds).—Practical demonstrations by the staff and occasional clinical lectures in the subjects of Ophthalmology, Otology, and Laryngology. Clinical instruction is given daily.

Belfast Fever Hospitals.—City Fever Hospital, Purdysburn (330 beds); Union Fever Hospital (200 beds). Clinical Classes are held during the winter and summer sessions. Post-Graduate (D.P.H.) Classes are also held. Lecturer: A. Gardner Robb, M.B., D.P.H.

Belfast Villa Colony Asylum (1000 beds).

IRISH MEDICAL CORPORATIONS GRANTING DIPLOMAS.

ROYAL COLLEGE OF PHYSICIANS OF IRELAND.

The College issues its Licences in Medicine and in Midwifery to practitioners whose names appear on the Medical Register of the United Kingdom.

The Licence in Medicine.—The subjects of examination are: Practice of Medicine, Clinical Medicine, Pathology, Medical Jurisprudence, Midwifery, Hygiene, and Therapeutics.

The Licence in Midwifery.—Candidates must produce certificates of registration. A registered medical practitioner of five years' standing may be exempted from the examination by printed questions.

The Membership.—Examinations for Membership are held in February, June, and November. The fee for the examination is £21 to Licentiates of the College, or £36 15*s.* to non-Licentiates.

The Fellowship.—Fellows are elected by ballot. Applicants must have been a Member of the College for at least one year and must have attained the age of 27 years. There is a fee of £35 in addition to a stamp duty of £25.

Further particulars can be obtained from the Registrar of the Royal College of Physicians of Ireland, 6, Kildare-street, Dublin.

ROYAL COLLEGE OF SURGEONS IN IRELAND.

The Licence in Surgery.—A candidate whose name is entered either on the Medical Register for the United Kingdom, the Colonial Medical Register, or the Foreign Medical Register of the year in which he presents himself for examination, and who satisfies the Council that he has passed through a course of study and Examinations equivalent to those required by the Regulations of the Conjoint Board of the Royal College of Physicians of Ireland and the Royal College of Surgeons in Ireland, preceded by the passing of an Examination in Arts recognised by the General Medical Council, may, at the discretion of the Council, be admitted to the Examination.

Candidates are examined in Surgery, Clinical Surgery, Operative Surgery on the subject, Surgical Appliances, and Ophthalmic Surgery.

Diploma in Midwifery.—A diploma in Midwifery is granted after examination to persons possessing a registrable qualification.

Fellowship Examinations.—Candidates for the Fellowship shall make application to the President and Council to be admitted to examination. They are required to pass two examinations—Primary and Final. Candidates may present themselves for the Final Examination immediately after passing the Primary part, provided they have complied with the necessary regulations. The subjects for the Primary Examination are (*a*) Anatomy, including Dissections; and (*b*) Physiology and Histology. The subjects for the Final Examination are Surgery, including Surgical Anatomy and Pathology. For admission to the Final Examination the candidate must have passed the Primary Examination, and must be a Licentiate or Graduate in Surgery of a university or licensing body recognised by the General Medical Council; all such candidates must not be less than 25 years of age.

Further particulars as to fees and conditions of examination can be obtained from the Registrar of the College, Stephen's-green West, Dublin.

ROYAL COLLEGE OF PHYSICIANS OF IRELAND AND ROYAL COLLEGE OF SURGEONS IN IRELAND.

Every candidate for the Conjoint Examinations of the Colleges shall produce evidence of having before entering on medical studies passed a Preliminary Examination in general education recognised by the Royal Colleges. Each candidate before receiving his diplomas must produce a registrar's certificate or other satisfactory evidence that he has attained the age of 21 years.

Preliminary Examination.—The subjects for examination are identical with those prescribed for the Preliminary Examination by the General Council of Medical Education and Registration.

Professional Examinations.—Every candidate must pass four professional Examinations—at the end of the first, second, third, and fifth years respectively of his professional studies. No candidate shall be admitted to the Final or Qualifying Examination within three months of his rejection at the Final or Qualifying Examination by any other licensing body.

First Professional Examination.—Every candidate is required, before admission to the First Professional Examination, to produce evidence—(1) of having passed in the subjects of the Preliminary Examination; and (2) of having attended a course of—(*a*) lectures on Theoretical Chemistry, six months; (*b*) Practical Chemistry, three months; (*c*) Biology, three months; and (*d*) Physics.

The subjects of the First Professional Examination are the following:—1. (*a*) Chemistry; (*b*) Physics. 2. Biology. The fee for this examination is £15 15*s.*

Second Professional Examination.—Candidates are not admissible to this examination till they have passed in the subjects of the First Professional Examination, and they must produce evidence of having attended (*a*) anatomical dissections, six months; and Lectures on (*b*) Anatomy, six months; (*c*) Physiology, six months; (*d*) Practical Physiology and Histology, three months.

The subjects of the Second Professional Examination are the following:—(1) Anatomy; and (2) Physiology and Histology. The fee for this examination is £10 10*s.*

Third Professional Examination.—Every candidate is required, before admission to the Third Professional Examination, to produce evidence of having passed the Second Professional Examination, and certificates of having attended courses of instruction in (*a*) the practice of a medico-chirurgical hospital for nine months; (*b*) Pathology—(1) Systematic, (2) Practical, three months each; (*c*) Materia Medica, Pharmacy, and Therapeutics, three months; (*d*) Forensic Medicine and Public Health, three months. The subjects for the Third Professional Examination are the following:—(1) Pathology; (2) Materia Medica, Pharmacy, and Therapeutics; (3) Public Health and Forensic Medicine. The fee for this examination is £9 9*s.* Clinical instruction in Ophthalmic and Aural Surgery, three months. The examination in Ophthalmic and Aural Surgery may be taken immediately after passing the Third Professional Examination.

Final Professional Examination.—Before admission to the Final Examination candidates must have passed the Third Professional Examination and produced evidence of having attended in Division I. the practice of a medico-chirurgical hospital for two periods of nine months each (unless such evidence has been previously produced for admission in Division II.); the practice of a recognised fever hospital or the fever wards of a recognised clinical hospital, three months; clinical instruction in Mental Diseases, one month (12 attendances); lectures on Medicine, six months at a recognised medical school; of having performed the duties of medical clinical clerk in a recognised hospital for three months; of having attended a course of instruction in post-mortem examinations and demonstrations during one session. In Division II. of having attended the practice of a medico-chirurgical hospital for two periods of nine months each (unless such evidence has been previously produced for admission to Division I.); lectures on Surgery, six months at a recognised medical school; instruction in Operative Surgery, three months at a recognised medical school; of having performed the duties of surgical dresser in a recognised hospital for three months; of having attended a course of instruction in the practical administration of general anæsthetics. In Division III. of having attended a midwifery hospital or maternity and having been present at 20 labours, six months; instruction on vaccination, six attendances to be certified by a public vaccinator; lectures on midwifery (including diseases peculiar to women and to new-born children), six months at a recognised medical school. Candidates are recommended to present themselves in all the subjects of the Final Examination at one time, but a candidate at or after the end of the fourth year may present himself in any one of the Divisions I., II., or III., provided he has completed his curriculum as far as concerns the division in which he presents himself. The examination in at least one of the divisions must be deferred till the end of the fifth year.

The subjects of the Final Examination are: (1) Medicine, including Fevers, Mental Diseases, and Diseases of Children; (2) Surgery, Operative; and (3) Midwifery and Gynæcology, Vaccination, and Diseases of New-born Children. The fee is £6 6*s*. Further particulars can be obtained from Alfred Miller, O.B.E., the Secretary of the Committee of Management, Royal College of Surgeons, Stephen's-green, Dublin.

Royal College of Surgeons in Ireland (Schools of Surgery).—The schools of surgery are attached by Charter to the Royal College of Surgeons and have existed as a department of the College for over a century. They are carried on within the College buildings and are specially subject to the supervision and control of the Council, who are empowered to appoint and remove the professors and to regulate the methods of teaching pursued. The buildings have been reconstructed, the capacity of the dissecting-room nearly trebled, and special pathological, bacteriological, public health, and pharmaceutical laboratories fitted with the most approved appliances in order that students may have the advantage of the most modern methods of instruction. The entire building is heated by hot-water pipes and lighted throughout by the electric light. Winter Session commences in October; Summer Session in April. Scholarships and Prizes: Carmichael Scholarship, £15; Mayne Scholarship, £8; Stoney Memorial gold medal; Operative Surgery, gold and silver medals; Barker Prize, £26 5*s*.; H. Macnaughton-Jones gold medal in Obstetrics and Gynæcology; and class prizes and medals. Prospectuses and guide for medical students can be obtained post free on written application to the Registrar, Royal College of Surgeons, Stephen's-green W., Dublin.

APOTHECARIES' HALL OF IRELAND.

The Licence of this Hall is granted to students who present certificates of having fully completed the course of study as laid down in the curriculum and who pass the necessary examinations. The diploma of the Apothecaries' Hall of Ireland entitles the holder to be registered as a practitioner in medicine, surgery, and midwifery, with also the privileges of the Apothecary's Licence. There are three professional examinations, the total fees for which amount to £26 5*s*. 6*d*. Women are eligible for the diploma.

There are four examinations—primary, intermediate, Parts I. and II., and final. They are held three times a year, in March, June and December. The primary examination comprises biology, physics, theoretical and practical chemistry (with an examination at the bench). Candidates holding a Pharmaceutical licence are exempt from this subject. Intermediate, Part I., Anatomy and Physiology. Intermediate, Part II., Pathology, Medical Jurisprudence, and Materia Medica and Pharmacy. The intermediate examination comprises anatomy of the whole body (including practical dissections), physiology, practical histology, and materia medica. The final examination comprises medicine, surgery, and midwifery.

Each candidate before receiving his diploma must produce evidence that he has attained the age of 21 years. The details of the course of education required and syllabus of the examinations will be supplied on application to the Registrar at 95, Merrion-square, Dublin.

HOSPITALS AFFORDING PRACTICE RECOGNISED BY THE IRISH UNIVERSITIES AND CORPORATIONS.[1]

Sir Patrick Dun's Hospital, Grand Canal-street, Dublin.—Classes both in Medicine and Surgery are held each morning from 9 o'clock from Oct. 1st till the end of June. Special classes for junior students will be held in the wards during the months of October, November, and December. A Resident Surgeon, with salary, is appointed annually. Ten Resident Pupils are appointed every four months. Six surgical Dressers and six Clinical Clerks are appointed each month. There are facilities for women students.

Prizes and Medals.—Clinical medals and prizes amounting to about £21 each will be awarded in Medicine and in Surgery respectively in accordance with the will of the late Rev. Samuel Haughton, M.D., S.F.T.C.D. Candidates who fail to obtain these medals and prizes will be awarded special certificates in Medicine and in Surgery provided they show sufficient merit.

Fees.—Winter and summer session, £12 12*s*.; winter session (six months), £8 8*s*.; and summer session (three months), £5 5*s*. Special certificate in anæsthetics, £1 1*s*. The practice of this hospital is open to all students, and the certificates are recognised by Dublin University, the National University and Royal Colleges of Surgeons of England, Ireland, and Scotland.

The Hospital is an official "Treatment Centre" for venereal diseases.

Further information will be supplied by the Hon. Secretary to the Medical Board.

Coombe Lying-in Hospital and Guinness Dispensary for the Treatment of Diseases Peculiar to Women, Dublin.—This hospital contains 70 beds and consists of two divisions, one of which is devoted to lying-in cases and the other to the treatment of diseases peculiar to women. The practice of this hospital is one of the largest in Ireland. Lectures are delivered, practical instruction given, and gynæcological operations are performed in the theatres daily. There is a general dispensary held daily, at which instruction is given on the Diseases of Women and Children. There is a special afternoon dispensary held by the Master and his assistants, at which practical instruction in gynæcology is given. There is no extra charge for attendance at this Dispensary. There is accommodation for intern pupils who enjoy exceptional advantages of acquiring a thorough knowledge of this branch of their profession. Lady medical students can reside in the hospital. The residents' quarters are comfortable. Clinical assistants are appointed from amongst the pupils as vacancies occur. Certificates of attendance at this hospital are accepted by all licensing bodies. Fees: Extern pupils for full course of six months, £8 8*s.*; three months, £4 4*s.* Intern pupils, one month, £4 4*s.*; each consecutive month, £3 3*s.*; six months, £18 18*s.* Registration fee, in advance, 10*s.* 6*d.* Students can enter for attendance at any time, but preference is given to those entering from the first day of the month. Further particulars may be had on application to the Master or the Registrar at the Hospital.

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[1] This list of the institutions recognised by the Conjoint Board of Ireland is supplemented in the regulations of the Colleges by those hospitals mentioned as recognised institutions in Scotland and England. The recognised facilities for clinical instruction in some of the Irish centres have been described.

ADELAIDE HOSPITAL, Peter-street, Dublin.—Fee for nine months' hospital attendance, £12 12*s.*; six months, £8 8*s.* Summer, three months, £5 5*s.*[1] Two resident surgeons are elected half-yearly and four or more resident pupils every four months. At the termination of the session prizes in Clinical Medicine, in Surgery, in Gynæcology, and in Dermatology will be awarded.

Hudson Scholarship.—In addition to the junior prizes the Hudson Scholarship, £30 and a gold medal, as well as a prize of £10, together with a silver medal, will be awarded at the end of the session for proficiency in medicine, surgery, gynæcology, and pathology.

The certificates of attendance are recognised by all the Universities and licensing bodies in the United Kingdom. Further particulars may be obtained from Dr. H. Bewley.

JERVIS-STREET HOSPITAL, Dublin.—Founded 1718; rebuilt 1886. 130 beds. A new out-patient department has been completed and contains all modern requirements.

MATER MISERICORDIÆ HOSPITAL, Dublin. (Under the care of the Sisters of Mercy.)—This Hospital was founded in 1861 by the Sisters of Mercy. It is the largest in Ireland, containing 382 beds, is open at all hours for the reception of accidents and urgent cases. Clinical instruction will be given by the Physicians and Surgeons at 9 A.M. daily. Ophthalmic Surgery will be taught in the Special Wards and in the Dispensary. Surgical operations will be performed daily. Connected with the hospital are extensive Dispensaries, which afford valuable opportunities for the study of general Medical and Surgical Diseases, and Accidents. Instruction will be given on Pathology and Bacteriology. Three House Physicians, nine House Surgeons, and 16 resident pupils will be elected annually. Dressers and Clinical Clerks will also be appointed. and certificates will be given to those who perform their duties to the satisfaction of the staff. Leonard Prizes will be offered for competition annually. For further particulars see prospectus. Certificates of attendance upon this hospital are recognised by all the Universities and licensing bodies in the United Kingdom. There is a Private Hospital for the reception of Medical and Surgical cases; also a Training School and a Home for Trained Nurses in connexion with the Hospital. Trained and experienced Nurses who have passed a qualifying examination in nursing can be obtained on application to the Lady Superior, Mater Misericordiæ Hospital.

Terms of attendance.—Nine months, £12 12*s.*; six winter months, £8 8*s.*; three summer months, £5 5*s.* Entries can be made with any of the physicians or surgeons, or with the Registrar, Dr. John O'Donnell, 3, Merrion-square. A prospectus containing in detail the arrangements for Clinical Instruction, Prizes, &c., may be obtained from the Secretary, Medical Board, Mr. H. Barniville, 9, Merrion-square.

MEATH HOSPITAL AND COUNTY DUBLIN INFIRMARY. This hospital was founded in 1753 and now contains 166 beds available for clinical teaching. A building containing 40 beds for the isolated treatment of fevers is attached to the hospital. The certificates of this hospital are recognised by all the universities and licensing bodies of the United Kingdom. Medical Clinical Clerks and Surgical Resident Pupils and Dressers are appointed every three months, and House Surgeons and Clinical Assistants are elected annually. Apply to Hon. Treasurer of Medical Board.

MERCER'S HOSPITAL.—This hospital, founded in 1734, is situated in the centre of Dublin, in the immediate vicinity of the Schools of Surgery of the Royal College of Surgeons, the Catholic University School of Medicine, and within five minutes' walk of Trinity College. It contains 120 beds for medical and surgical cases, and arrangements have been made with the medical officers of Cork-street Fever Hospital whereby all students of this hospital are entitled to attend the clinical instruction of that institution and become eligible for the posts of Resident Pupil, &c. There is a large dispensary for out-patients. An electrocardiograph has been installed. Students of the hospital are permitted to attend the gynæcological department, where they receive practical instruction. There are special wards for the treatment and study of children's diseases. During the past few years the hospital has undergone extensive alterations in order to bring it up to modern requirements.

Appointments.—A House Surgeon is appointed annually. There are six men and two women Resident Pupils, and Clinical Clerks and Dressers are appointed from amongst the most deserving members of the class.

Fees.—Winter, six months, £8 8*s.*; Summer, three months, £5 5*s.*; nine months, £12 12*s.*

For further particulars apply to Dr. Bethel Solomons, Hon. Sec., Medical Board, 42, Fitzwilliam-square, Dublin.

NATIONAL MATERNITY HOSPITAL, Holles-street, Dublin.—Established 1894. The hospital consists of an Intern and Extern Maternity, Gynæcological Wards, and a Dispensary for the treatment of Diseases of Women and Children. About 1035 cases are admitted and over 300 operations are performed annually. Every facility is given for the carrying out of practical work. Post-graduate and special courses are arranged for at any time. Certicates of attendance at this hospital are recognised by all the licensing bodies. Terms (three months' course) 6 guineas. Board £2 2*s.* per week. Medical men can take out Post-graduate courses by paying a fee of £3 3*s.* for the month. Clinical Lectures are given daily and Oral Lectures four times per week. During the past year over 50 Post-graduate students were admitted. The L.M. Diploma is given by special examination on arrangement with the Masters. Further particulars can be obtained from the Masters: Sir Andrew Horne, 94, Merrion-square, Dublin; Dr. Patrick McArdle, 27, Merrion-square; or from the Secretary, Holles-street, Dublin.

RICHMOND, WHITWORTH, AND HARDWICKE HOSPITALS (HOUSE OF INDUSTRY HOSPITALS), Dublin.—These hospitals contain 330 beds—130 for Surgical cases, 80 for Medical cases, 78 for Fever and other Epidemic Diseases, and an Auxiliary Wing of 42 beds. A Resident Physician and a Resident Surgeon are appointed each half year and are paid for their services. 20 Resident Clinical Clerks are appointed each quarter and provided with furnished apartments, fuel, &c. These appointments are open not only to advanced students but also to those who are qualified in Medicine and Surgery. The Dressers are selected from among the best qualified of the pupils without the payment of any additional fee. Women students are eligible for election as residents and special apartments are reserved for their use. For prospectuses apply to Mr. Adams McConnell, F.R.C.S.I., Hon. Secretary, 69, Fitzwilliam-square, Dublin.

ROTUNDA HOSPITAL, Dublin.—This institution is the largest combined gynæcological and maternity hospital in the British Empire. Over 4000 confinements are attended annually and 500 gynæcological patients admitted. Students can take out their necessary gynæcological and midwifery practical courses. The work of the hospital is carried on continuously through the year and consists of daily clinical instruction in the maternity department and examination and operations in the gynæcological department. Qualified students are given facilities for studying and assisting in the management of all abnormal cases so far as is practical. The appointments on the staff of the hospital are given to qualified past students of the hospital who have taken the L.M. and consist of Extern Assistants for six months, one being appointed every three months. From these the Assistants to the Master are appointed. Women students can reside in the hospital on the same terms as men. The L.M. is granted by examination after a six months' course. Fees for Intern students: one month £6 6*s*., months other than the first £4 4*s*., three months £12 12*s*., six months £21. For further particulars apply to the Master.

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[1] Special Lectures in Dermatology are given weekly; also practical demonstrations on the treatment of fractures from time to time.

ROYAL CITY OF DUBLIN HOSPITAL.—Founded 1832; enlarged 1851; rebuilt 1893. 130 beds. There is a special wing for the treatment of fevers and contagious diseases founded by the late Mr. Drummond. Secretary: G. R. Shine.

ROYAL VICTORIA EYE AND EAR HOSPITAL, Dublin.—Established 1844. Incorporated 1897. 102 beds. In-patients, 1499; out-patients, 8492. Two house surgeons for Eye and one for Ear appointed annually.

DR. STEEVENS' HOSPITAL, Dublin (Kingsbridge).—Established 1720. 250 beds. Patients, intern, 1329; extern dispensary attendances, including special V.D. Clinic, 16,390. There is accommodation for 12 Resident Pupils, each of whom is provided with a separate bedroom, and board is supplied by the Hospital, at a reasonable rate. All information with regard to the terms for such residency can be had from the Resident Surgeon at the Hospital. Secretary: E. D. F. Banks.

ST. VINCENT'S HOSPITAL AND DISPENSARY, Dublin.—Established 1834. 200 beds. Clinical Lectures in Medicine and Surgery are held from October to June. Special classes for Juniors from October to December. Pathological and Bacteriological Demonstrations are given every Thursday, and instructions in the use of Laryngoscope and Otoscope for Senior students every Saturday. Medals and Prizes: the Bellingham gold medal in Medicine and the O'Farrell gold medal in Surgery are offered for competition at the end of the summer session, as well as junior prizes, also the Surgeon McArdle Prize, value £20. In the coming term it is hoped that there will be opened a New Extern Department and a New Pathological Laboratory. Dr. Meenan, hon. secretary, 28, Fitzwilliam-square.

DIPLOMAS IN PSYCHOLOGICAL MEDICINE.

THE Universities of Cambridge, London, Durham, Leeds, Manchester, and Edinburgh, and the Conjoint Board of the R.C.P. Lond. and R.C.S. Eng. now grant diplomas in psychological medicine under conditions that are fairly comparable in the standard of the tests and in the duration of the courses; the details on these points can be obtained from the various examination bodies. Much thought to-day is being directed to the medical side of lunacy administration. There is a strong feeling within the medical profession, as well as among the public, that the numerous barriers preventing the intelligent treatment of in-patient mental cases should be relaxed. The position of uncertifiable cases requiring mental treatment is being considered, for many of these cases pass from uncertifiable into certifiable, by which time they have become resistant to treatment. There is no doubt whatever of the high scientific standard of the work that is to-day projected by all leading psychiatrists, and as the conditions of service improve there should be no lack of recruits of the right stamp.

In London, courses of instruction for the Diploma in Psychological Medicine are given at the Maudsley Hospital, Denmark Hill. The course consists of two parts, and is adapted for the diploma of the Conjoint Board, the University of London, or the University of Cambridge, Part I. being conducted by Sir Frederick Mott, Dr. F. Golla, and Dr. Henry Devine. Sir Frederick Mott gives eight lectures on the anatomy of the nervous system, followed by practical instruction and demonstrations on the methods of staining nervous tissue and preparing it for microscopical examination; microscopic sections are distributed, illustrating the principal diseases of the nervous system, for mounting as a permanent collection. Dr. Golla gives eight lectures on the physiology of the nervous system, followed by practical instruction and demonstrations on physiological chemistry (including the chemistry of the nervous system, physico-chemical methods, blood and urine analysis, and gastric contents analysis), and practical physiology (including the recording of reflexes and tremors in man and the action of drugs on the autonomic system). Similarly, Dr. Devine gives eight lectures on psychology, followed by practical instruction and demonstration of psycho-physical methods, and memory and intelligence tests.

In Part II. of the course Sir Frederick Mott gives six lectures on the pathology of mental diseases, including brain syphilis, its symptomatology and treatment. Dr. Bernard Hart gives eight lectures on the psychoneuroses. Sir Frederick Mott and Dr. Golla give 12 clinical demonstrations in neurology, the first six demonstrations being given by Dr. Golla at the Hospital for Paralysis and Epilepsy, Maida Vale. Dr. F. C. Shrubsall gives eight lectures on the practical aspect of mental deficiency. Dr. W. C. Sullivan, medical superintendent of Broadmoor Asylum, gives six lectures on crime and insanity. Dr. C. Hubert Bond and Dr. E. Mapother give a course of lectures on the differential diagnosis and treatment of mental disorders and the legal relationships of insanity. The fee for the whole course (Parts I. and II.) is 15 guineas, or for either part separately 10 guineas; for one single series of lectures in Part I. the fee is four guineas, and in Part II. two guineas. Inquiries as to lectures, &c., should be addressed to the Director of the Pathological Laboratory, Maudsley Hospital, Denmark Hill, S.E. 5.

Part II. of the course will commence during the first week of October.

A course of lectures and practical instruction for the Diploma in Psychological Medicine, granted by the various Universities, is held at Bethlem Royal Hospital twice annually, during the spring and autumn. The next course, which begins on Sept. 17th, will consist of two parts, A and B. Part A deals with anatomy, histology and physiology of the nervous system, and psychology, the lecturers being Drs. S. A. K. Wilson, C. Worster-Drought, F. C. E. Danvers-Atkinson, Clement Lovell, William Brown, and J. A. Hadfield, and demonstrations of the normal anatomy and histology of the central nervous system and endocrine glands will be given. Part B includes Neurology, Psychological Medicine, and Mental Deficiency, the additional lecturers being Drs. James Collier, R. H. Cole, E. D. Macnamara, J. G. Porter Phillips, Thomas Beaton, C. Stanford Read, W. H. B. Stoddart, M. Hamblin Smith, and A. F. Tredgold. The fee for the full course is 15 guineas; for Part A separately 10 guineas, and for Part B separately 10 guineas.

All communications concerning the course should be addressed to the Physician-Superintendent, Bethlem Royal Hospital, London, S.E. 1.

In addition clinical instruction in psychological medicine is given at Bethlem Royal Hospital every morning (except Wednesdays) at 11 A.M. The fee for post-graduates is five guineas for three months' attendance, but a reduction is made to those who attend the course for the Diploma in Psychological Medicine.

WE take this opportunity of thanking the Deans and Secretaries of the various institutions for their kind coöperation in enabling us to bring the information contained in our Students' Number up to date.

THE LANCET.

LONDON: SATURDAY, AUGUST 25, 1923.

THE OUTLOOK IN MEDICINE.

THE prospect in medicine for the newly qualified man or woman has in these days become very wide, and we set out in the present issue signposts to a number of different careers which may be chosen. The choice is largely a matter of personal bent, for in no single direction is there any doubt that average ability combined with diligence and good health will produce an economic return. But the zest associated with any particular career will depend more than anything else upon the practitioner's relation to his environment. The true spirit of medicine is the love of humanity associated with the love of craft, and the free and unfettered practice of his craft has been profoundly modified by the happenings of the last 20 years. The relation between the State and the doctor is changing; apart from the fact that he may be called upon to undertake official duties in the public service, the doctor is liable under statute in the following respects[1]:—

1. He must certify births and deaths (Births and Deaths Registration Act, 1874), and notify all births within 36 hours (Notification of Births Acts, 1907–15); he must notify cases of infectious disease (Infectious Diseases Notification Acts, 1889 and 1899, and special notification regulations as issued), of industrial poisoning (Factory and Workshop Act, 1901), and of verminous children (Children Act, 1908). He must also be ready to vaccinate (Vaccination Acts, 1871–1907) and to certify the removal of infectious cases to hospital (Public Health Act, 1875).
2. He may be called upon to inspect and certify for house disinfection (Public Health Act, 1875, and Infectious Disease Prevention Act, 1890), and be prepared to issue certificates for the removal and burial of dead bodies (Ibid.).
3. He may be required to inspect and condemn in regard to nuisances and insanitary house property (Public Health Act, 1875, or Amendment Act, 1907), or inquire into unhealthy or insanitary areas (Housing of the Working Classes Act, 1890).
4. He must know something of the ill-effect upon health of dangerous or offensive trades (Public Health Act, 1875), and of unsound food (Public Health (Unsound Food) Regulations, 1908).
5. He must be competent to diagnose all forms of mental disease (Mental Deficiency Act, 1913).
6. He must be available to respond to the requirements of the local sanitary authority for the provision of medical assistance and treatment for the poorer inhabitants of the district in which he lives (Public Health Act, 1875, s. 133).
7. He is liable for a series of duties in regard to workmen's compensation (Workmen's Compensation Act, 1906, s. 8), superannuation, and pension claims (Ministry of Pensions Act).
8. He may be called in by a midwife to assist in cases of emergency (Midwives Act, 1918, s. 25).
9. The local education authority may avail themselves of his services in connexion with the treatment of children and young persons (Education Act, 1918, s. 25).

Besides these obligations which no practitioner can escape there are others which he can voluntarily take upon himself. Systematic provision has been initiated for tuberculosis, venereal disease, and maternity and infant welfare; the organised treatment of early mental affection, of orthopædic cases, and of industrial diseases is under discussion, while the National Insurance Act of 1911 brought at one stroke 12 million insured persons into medical benefit, to be provided under contract by some 12,000 doctors. The Act imposes obligations and privileges on both sides which can hardly be enforced without continuous supervision, and this is distasteful[2] to a body of competent and qualified medical men. Their voluntary exclusion from this service does not imply "its irremediable failure," but those who feel with the non-panel advocate will not find congenial occupation within the boundaries of the Act, and should not try to do so. Submission to various kinds of interference is a condition of many of the careers enumerated. The régime of the medical departments of the three fighting services and of the Indian Medical Service, not as strict as it was, is still precise, and in any branch of the Public Health Service the doctor acts under the instruction of his official superior, who is finally responsible to the Public Health Committee of the area, a body which may consist wholly of laymen, and from which even the medical officer of health has no right of direct appeal to the council of which he is the servant.

But the immunity of the individual practitioner from interference is largely illusory. Individualism in the past, desirable as it was in many respects, resulted in the sweating and exploitation of practitioners by friendly societies and clubs, while any form of collective bargaining does away to some extent with the liberty of the individual bargainer. The feeling of individual security received a rude shock two years ago when an action was brought against an independent practitioner for alleged negligence in the treatment of a fractured femur. Though evidence was brought forward to show that the case was treated on approved modern methods, the jury returned a verdict against him with damages to the amount of £750, the total costs of the action amounting to £2250. The practitioner, being unprotected by membership of any defence society, would have himself incurred this great loss, had not the medical profession as a whole come to his aid and voluntarily contributed a sum of over £1730. Able himself to smile at bad fortune, "for," as he wrote, "the Fates singled him out to try his courage," the obvious lesson of his misfortune has not been lost, for the present membership of the two English medical defence societies exceeds 17,500 and is increasing at the rate of 100 or more a month. One of these societies has now raised to £3000 the amount of damage against which the practitioner can insure, and there is also a Scottish protection society. In the coroner's court, too, the individual practitioner must count on appearing more frequently and on receiving at times much greater attention in the lay press. No doubt, in all these matters the right course for the practitioner is "to preserve such a character that if accused the presumption will be in his favour."[3] Nevertheless, he needs to be well versed in the laws of evidence and should add to his rôle of well-informed and truthful witness some ophidian readiness in repelling hostile attack. For the conduct of practice itself the Golden Rule and the desire to do his best for his patient will suffice; the less said about these obvious professional virtues the better, but we doubt whether the abortive discussion of three years ago at the General Medical Council on the teaching of medical ethics should not be revived now that other urgent educational matters have been dealt with. Room in the curriculum might be found for instruction in the responsibilities of the medical man towards the State, and it is reasonable for the students to receive during pupillage information upon the working of the Medical Acts and upon all rules and regulations which will form the conditions of any State service undertaken later.

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[1] Sir George Newman: Introductory Address at a meeting of the British Medical Association.

[2] Dr. A. Blackhall-Morison: "The Failure of the Panel System," The English Review, August, 1923.

[3] Dr. Robert Saundby: "Medical Ethics," 1907.

NAVAL MEDICAL SERVICE.

The life offered to officers of the Royal Naval Medical Service is one that ought to appeal to a large section of recently qualified medical men. There is no intention in what follows, under this or the subsequent headings, to pit one Service against the other or to recruit in one direction more than in another. The particular regulations for each Service should suffice to give each man the necessary impetus for a decision, but it is useless to disguise the fact that the attitude of the authorities in respect to the compulsory retirement at the age of 50 of a group of surgeon commanders who were under contract to be employed until the age of 55 has produced an unfortunate impression. It creates a difficulty for those who are in a position to advise young men as to their future careers when they give counsel based upon engagements which may later be repudiated. The situation has evoked a formal protest from the British Medical Association, and although no specific action was recommended to the Association by its Representative Body, certain protests have found their way into the public press and cannot have failed to prejudice recruiting for the service.

In the Navy the young medical officer sees the world in congenial company and with an assured position, the pay is good, the pensions are commensurate, and the opportunities offered now for scientific work are real, while, if they are taken, promotion awaits the officer on grounds of professional merit.

Rank of Surgeon Lieutenant-Commander will be granted to surgeons at the expiration of six years from date of entry, and the point upon which stress should be laid is that special promotion can be made in cases of conspicuous professional merit, which is thus placed on a par with general service. Six years later the period of promotion to Surgeon Commander is reached, after having passed the qualifying examination, when again special promotions can be made for conspicuous professional merit as well as for distinguished service; but promotions are limited in number, save, of course, for gallantry in action. This recognition of professional attainment should prove a very real incentive to progressive scientific work. The same principle prevails in the higher ranks. Promotions to Surgeon Captain and later to Surgeon Rear-Admiral are made strictly by selection, but are confined to officers who prove fitted, both professionally and as administrators, for this rank.

Naval life may lead to opportunities for putting into practice much of what has been learned in the clinical wards of a hospital. Further, the opening for preventive medicine is large and many-sided, while appointments to the large shore establishments enable medical officers to keep their work modern.

New chemical explosives, as well as the extraordinary behaviour of common articles under extraordinary conditions of stowage, furnish perpetual problems and surprises for the medical officer on board ship, and bring him into intimate connexion with his charges in a way that is particularly necessary considering the conditions of life. No medical officer can expect to succeed unless he secures the confidence of those committed to his charge, and the health lectures which he is bound to deliver will be much more fruitful if they are delivered to an audience which trusts him. Moreover, the delivery of official lectures does not end this side of the medical officer's duties. He must be ready to answer questions, sometimes of real acuteness, which are put to him by the modern blue-jacket, and he will find that his lectures will often afford a starting point of work that may develop into great professional interest. Thus, without his being necessarily a psychologist, his influence will be felt by both officers and men, until the well-being of the ship may be profoundly affected by the extent of his tact and skill; for example, small matters assume undue proportion under stress of confinement, and the medical officer should be quick to detect danger signs and warn his commanding officer. Numerous changes have been introduced during the last 20 years into the naval dietary, many of which were the outcome of representations and research by naval medical officers. The work wants carrying on, for much of it has gone to show that the food problem is very complicated. Every medical officer on board ship should make himself acquainted with food values and the human powers of assimilation under varying conditions of work and climate, and here there is ample scope for research. The modern requirements of gunnery and navigation necessitate precision in their use and have made ophthalmology a valuable subject for study in the Navy. The physical training of both officers and men is based on physiological axioms which are peculiarly the field of the medical officer; this training should be the subject of a watchful eye. There is no lack of scope here for professional work without making any reference to the vast problems which have to be faced when the medical officer has to arrange his particular department to the best advantage during or after an action. It is certain that he will not be able to do this unless in times of peace he gets himself ready by study. Lastly, there is the whole field of venereal and tropical disease.

The young medical officer need not be afraid that his work will be without scientific interest if he takes the opportunities offered him.

Conditions of Service.

For the time being the regulations for entry by examination into the permanent service are in abeyance, but a short service scheme providing for transfer to the permanent service has been inaugurated. The regulations for the entry of surgeon lieutenants under this scheme provide for the usual qualifications of registration, good character, physical fitness, and age—the age not to exceed 30 years. The conditions of service are a three years' engagement with an option of a further year, to serve when and where required under the general rules of the service as regards discipline, and to rank with, but after, surgeon lieutenants in the permanent service, and to receive two calendar months' notice of services being no longer required.

The pay is £1 6*s.* 6*d.* per day, or £483 12*s.* 6*d.* per year, while there is a gratuity on discharge of £8 6*s.* 8*d.* for each completed month of service. A gratuity to officers invalided for causes not within their own control is payable, while the same allowances are received as are payable to permanent officers of similar rank, and lodging and provision allowances will be made and be subjected to revision from time to time. The rates mentioned are £80 a year when employed on shore without quarters, and £60 a year in lieu of rations when not victualled in kind, while arrangements are made for officers in temporary employment on shore. No unemployed or half pay is granted, but there are pensions for wounds or injury on duty, and in the event of death the officer's widow and children would fall under regulations applying to officers on the permanent list. There is an equipment allowance for ordinary uniform of £50, but the officer provides himself with a pocket case of instruments and a stethoscope.

A short service surgeon lieutenant after six months' service, on application to the Secretary of the Admiralty, may be considered for transfer to the permanent service on a satisfactory report being received from the senior medical officer of the Squadron, Hospital or Depot in which he has served or is serving as to his professional ability, and a favourable report from his commanding officer as to conduct. Such candidates must have been under the age of 28 on joining for short service, and officers so transferred will not be eligible for the gratuities provided. They will be permitted to count their seniority from date of entry for short service for purposes of promotion and for increment of full pay, and similarly they will be permitted to count their service from the date of entry for purposes of retired pay, but for purposes of retiring gratuity on the permanent officers' scale their services will be reckoned only from the date of transfer to the permanent list, this date being that of receipt in the ship or establishment in which the officer is serving of the order for his transfer to the permanent list. Until that date he will retain his temporary rate of pay.

If a short-service lieutenant wishes to transfer to the permanent service he will then come under the following conditions of pay and pensions :—

RATES OF PAY AND PENSION.

——	Year of 365 days.			One day.		
	£	s.	d.	£	s.	d.
Surgeon Rear-Admiral ..	1916	5	0	5	5	0
Surgeon Captain :						
On promotion	1186	5	0	3	5	0
After 3 years' seniority ..	1277	10	0	3	10	0
,, 6 ,, ..	1368	15	0	3	15	0
,, 9 ,, ..	1460	0	0	4	0	0
Surgeon Commander :						
On promotion	821	5	0	2	5	0
After 3 years' seniority	894	5	0	2	9	0
,, 6 ,, ..	967	5	0	2	13	0
,, 9 ,, ..	1040	5	0	2	17	0
Surgeon Lieutenant - Commander :						
On promotion	638	15	0	1	15	0
After 3 years' seniority	675	5	0	1	17	0
Surgeon Lieutenant :						
On entry	438	0	0	1	4	0
After 3 years' seniority ..	529	5	0	1	9	0

On first appointment to the Service, Medical Officers will receive full pay from date of appointment, but subject to the provisions of Article 1347 of the King's Regulations, 1913.

Flag Allowances.

An allowance of 5*s.* 0*d.* a day in addition to full pay is granted to the Senior Medical Officer of a flagship bearing the flag of a Commander-in-Chief. An allowance of 2*s.* 6*d.* a day is granted to the Senior Medical Officer of a ship bearing other flags or broad pendants.

Rates of Pension.

Compulsory retirement will be as follows :—

(i) Surgeon Rear-Admirals retire at the age of 60 with retired pay at the rate of £900 per annum plus £22 per annum for each year's service over 27 years counting for retired pay, subject to a maximum rate of £1010 per annum. If, however, less than 27 years' service counting towards retired pay is rendered, a deduction of £22 per annum is made for each full year wanting to complete that period, subject to a minimum of £790 per annum.

(ii) Surgeon Captains retire at the age of 55. Maximum retired pay, £900.

(iii) Surgeon Commanders retire at the age of 50. Maximum retired pay, £600.

(iv) Surgeon Lieutenant-Commanders and Lieutenants retire at the age of 45. Maximum retired pay, £450.

Subject to these maxima, the rates of retired pay for Surgeon Captains, Surgeon Commanders, Surgeon Lieutenant-Commanders, and Surgeon Lieutenants are as follows :—

Age on retirement.	Retired pay.	Period of service (years) counting towards retired pay.	(A)		Age on retirement.	Retired pay.	Period of service (years) counting towards retired pay.	(A)	
			Addition.	Deduction.				Addition.	Deduction.
	£ (p.a.)		£ (p.a.)	£ (p.a.)		£ (p.a.)		£ (p.a.)	£ (p.a.)
55	790	24	22	15	47	562	20	15	15
54	765	24	22	15	46	525	20	15	15
53	742	23	22	15	45	487	19	15	15
52	720	23	22	15	44	450	19	15	15
51	697	22	22	15	43	412	18	15	15
50	675	22	15	15	42	375	18	15	15
49	637	21	15	15	41	337	17	15	15
48	600	21	15	15	40	300	17	15	15

(p.a.) = per annum.

(A) Addition for each full year's service in excess of that specified in column 3 or deduction for each full year wanting to complete that period of service—addition or deduction limited to five years in each case.

DENTAL BRANCH.

The Naval Dental Service offers similar opportunities to qualified dental surgeons except that higher rank than that of Surgeon Commander (D) is not open to them. They are provided with suitable surgery accommodation equipped with modern appliances and supplied with all material required for their work, and there is every opportunity for them to maintain a high standard of professional skill.

Entry is by competition, the Competitive Entrance Examination being similar in scope to the Final Qualifying Examination. Candidates are required to produce the usual certificates of birth, registration and of character, and must be physically fit for service anywhere. They must not be more than 28 years of age on the day of commencement of the entrance examination. An outfit allowance of £50 is payable to officers finally entered.

Provision has been made for candidates who, at the time of passing the examination, hold or are about to hold an appointment as Dental Officer in a recognised Civil Hospital. The time concerned, provided it does not exceed six months, may reckon for increase of full pay while on the active list. It is also proposed to allow a three months' Post-graduate Course to Surgeon Lieutenant Commanders (D) of over two years' seniority. The rates of full pay are as follows :—

Pay and Allowances.

NOTE.—20 per cent. of these rates of full pay, half-pay, and retired pay are considered as due to the present high cost of living, and are subject to change on or after the 1st July 1924, and thereafter every three years, either upwards or downwards, according as the cost of living rises or falls.

Full Pay.

——	Year of 365 Days.			One Day.		
Surgeon Lieutenant (D) :	£	s.	d.	£	s.	d.
On entry	401	10	0	1	2	0
After three years	492	15	0	1	7	0
Surgeon Lieutenant-Commander (D) :						
On promotion	593	2	6	1	12	6
After 3 years' seniority	629	12	6	1	14	6
,, 6 ,, ,, ...	666	2	6	1	16	6
,, 9 ,, ,, ...	730	0	0	2	0	0
Surgeon Commander (D) :						
On promotion	775	12	6	2	2	6
After 3 years' seniority	839	10	0	2	6	0
,, 6 ,, ,, ...	912	10	0	2	10	0

On first appointment to the Service, Dental Officers will receive full pay from the date of appointment, but subject to the provisions of Article 1347 of the King's Regulations, 1913.

Dental Officers are eligible for the same rates of lodging and provision allowances as other officers of equivalent rank and are entitled to the same privileges. The rates of half-pay are :—

Half-Pay.—In the case of Dental Officers, a distinction is to be drawn between (*a*) Officers awaiting employment, and (*b*) those who are permitted, for private reasons, which the Admiralty regard as satisfactory, to refuse an appointment or to have their appointment cancelled, or who are unemployed at own request or in consequence of misconduct.

In the former case, (*a*), Officers are to receive unemployed pay, as follows :—

For the first six calendar months, full pay of rank (without allowances). For the next six calendar months :—

	s.	d.	
Surgeon Lieutenants (D)	17	0	a day
,, Lieutenant-Commanders (D) ..	22	6	,,
,, Commanders (D)	27	6	,,

Thereafter :—Half the full pay of their rank and seniority on the Executive Officers' scale, viz. :—

	s.	d.	
Surgeon Lieutenants (D)	8	6	a day
,, ,, of 4 years' seniority ..	10	0	,,
,, Lieutenant-Commanders (D)	15	0	,,
,, ,, ,, of 3 years' seniority	16	0	,,
Surgeon Lieutenant-Commanders (D) of 6 years' seniority	17	0	,,
Surgeon Commanders (D)	20	0	,,
,, ,, of 3 years' seniority	22	0	,,
,, ,, of 6 ,, ,,	24	0	,,

Unemployed pay will not, however, be granted in cases, where an Officer is undertaking continuous professional work for which payment is made.

In the latter case, (*b*), Officers may receive half the full pay of their rank and seniority on the Executive Officers' scale.

Periods during which unemployed Full Pay or Unemployed Pay are received will only count as half-pay time.

An Officer who is permitted, for private reasons, to decline an appointment, or to have his appointment cancelled will not be entitled to any Unemployed Pay. In such cases, Officers may be placed on Half-Pay, and the conditions of retirement, Widows' Pensions, Leave, &c., are the same as for medical officers of equivalent rank and seniority.

Arrangements are also made whereby officers may be allowed to withdraw from the Service after four years' service and receive gratuities on the following scale :—

(*a*) Gratuities will be awarded on retirement and withdrawal on the undermentioned scale.

Rank.		Gratuity.		
		£	*s.*	*d.*
Surgeon Lieutenant (D), Surgeon Lieutenant-Commander (D), and Surgeon Commander (D) :				
After 4 years' full-pay service		500	0	0
,, 8 ,, ,,	including service allowed by paragraph 13.	1,000	0	0
,, 12 ,, ,,		1,500	0	0
,, 16 ,, ,,		2,250	0	0

ARMY MEDICAL SERVICE.

The recent alterations in the conditions of service in the Royal Army Medical Corps, which constituted, as we said at the time, the greatest reform that has taken place in that Service for a generation, have well fulfilled their promise. For many reasons which are obvious and have been detailed on previous occasions, the Service can be thoroughly recommended to young medical practitioners. Competitive examinations for commissions into the R.A.M.C. are held twice a year, usually in January and July. The Regulations for admission to the R.A.M.C. should be obtained from the Army Medical Department, War Office, London, S.W. 1, and carefully studied.

These are the things which the man who contemplates joining the Service should bear in mind. The rates of pay and allowances are good; the chances of seeing the world and the opportunities for post-graduate study are generous, and the work is nowadays varied, responsible, and interesting. At certain periods the young officer is relieved from all other duties for five months for the purpose of post-graduate study. During this period he is on full pay and the fees for his courses of instruction are paid by the State. His time is devoted to post-graduate work, and the leading clinical and scientific institutions are coöperating to secure that this post-graduate work shall be real and fruitful. Officers who show a marked aptitude for special subjects and have had previous practical experience in them are now selected to undergo a specialist course lasting for a further four months, thus giving these officers a post-graduate course of nine months. At the same time, in districts where the privilege would be of the most practical value, opportunities are forthcoming for young officers to attend the clinical practice of large local general hospitals.

By a Royal Warrant issued in September, 1919, medical and combatant officers were placed on the same footing as regards retired pay, and the fact that medical officers enter the Service after a long and expensive training some five years later in life than combatant officers was overlooked. This inequality of treatment has now been rectified, with the result that a medical officer of 20 years' service or over gets £75 per annum more pension than a combatant officer with the same number of years' service.

Once again let us deal with the most frequently repeated criticism of the Service—namely, that administration eternally takes the *pas* of science. The Directorates in Pathology and Hygiene which were recently created in the R.A.M.C., and which we may say have proved a marked success, form a complete answer to such criticism, however just it was in the past. This scheme of creating Directorates permits specially selected men to rise from all ranks to Major-General on the strength of their scientific work. Hitherto, a few notable men being excepted, the rule in the R.A.M.C. has been that, whatever a man's qualifications or abilities, on attaining the rank of Lieutenant-Colonel, he must be prepared to go off into administrative work and leave his scientific duties to his juniors. If he preferred to remain working in bacteriology, in preventive medicine and hygiene, or in tropical diseases, for example, he could do so, but, except in extraordinarily fortunate circumstances for himself, he would find that his devotion to science had cost him all chances of further rise in his Service, promotion being reserved for the administrative billets. This now has all been changed, and the change has its expression in these Directorates. All ranks up to and including the rank of Lieutenant-Colonel can draw specialist pay and hold appointments carrying allowances. The following is the scale of additional pay and charge pay :—

Additional Pay and Charge Pay for Officers of the R.A.M.C.

(1) Officer not above the rank of lieutenant-colonel, while acting as specialist in a post considered by Our Army Council to merit the grant of additional pay, according to subjects or groups of subjects as under, within a limit of 5*s.* a day :—

Operative Surgery, advanced; Medicine; Ophthalmology; Gynæcology and Midwifery; Dermatology, including Venereal Disease, 5*s.* daily.

Otology, Laryngology, and Rhinology; Radiology; Anæsthetics; Mental Diseases; Hygiene; Pathology; subjects other than above, at the discretion of Our Army Council, 2*s.* 6*d.* daily.

Officers granted temporary higher rank while holding appointments in the services of hygiene and pathology will not be eligible for additional pay as specialists while holding such temporary rank.

(2) (*a*) Officer in charge of a hospital.—If the number of equipped beds, as certified by the Deputy Director of Medical Services, exceeds—

50 beds	.. 2*s.* 6*d.* daily.	300 beds	.. 7*s.* 6*d.* daily.
150 ,,	.. 5*s.* 0*d.* ,,	500 ,,	.. 10*s.* 0*d.* ,,

Officer in charge of a medical or surgical division of a general hospital with not less than 300 beds—half the above rates.

	Daily.	
	s.	d.
(*b*) Senior medical officer, Royal Arsenal not exceeding	10	0
(*c*) Officer in command of the depot, Royal Army Medical Corps	5	0
(*d*) The senior officer of Our Army Medical Service with an army in the field : A rate to be fixed by Our Army Council according to the magnitude of the charge.		
(*e*) The officer, if under the substantive rank of colonel, holding the appointment of senior medical officer in a command abroad, or of assistant director of medical services, if the number of soldiers is 1500 or upwards	5	0
(*f*) Adjutant R.A.M.C. Depôt	5	0
(*g*) Adjutant R.A.M.C. (Territorial Army)	2	6

Further, an officer, graded as a specialist, and appointed to the charge of a medical or surgical division of a general hospital may be allowed to retain his additional pay and to draw the rate of charge pay laid down for the officer in charge of a medical or surgical division of a general hospital, provided that the total of additional and charge pay so drawn does not exceed the rate of charge pay drawn by the officer in charge of the hospital. With this exception charge pay and additional pay as specialist will not be issuable concurrently. It may be here pointed out that the distinction between scientific and administrative work is largely verbal. Take the conduct of a large hospital—is it possible to separate the scientific routine which is designed to ensure progressive therapeutics from the administrative work which provides and maintains the premises and service, and selects and oversees the personnel ?

Under the conditions enumerated the possibilities or good workers is very great in the R.A.M.C.; they will attain to positions of proper trust and emolument y scientific work. This should much improve ecruiting among the officers of the R.A.M.C. But here will almost certainly follow arrangements by which all special medical service will receive higher onsideration in the Corps. Not only is there in he work of the Army Medical Department scope for riginal labour and research in tropical disease, n preventive medicine, and in bacteriology, as well s in the vast clinical field open to the specialist n medicine, surgery, or gynæcology, in venereal lisease, in ophthalmology, and so on, but it is proposed o develop a scheme whereby child welfare shall be ndertaken systematically by the R.A.M.C. A cheme of this sort is already running successfully at ldershot, and we see in this direction a fine opening or preventive medicine, and one which should bring he officers of the R.A.M.C. into touch with the soldiers n a valuable and intimate manner.

The above schemes for the stimulation of purely rofessional work among officers of the Corps must ot be taken to imply that instruction in adminis- rative work has been overlooked. One of the essons of the war was that good administration must xist for the fullest benefit to be obtained from he professional talent available. The necessity of raining officers who may display capacity for rganisation and administration has not been lost ight of, and there are many appointments of varying legrees of importance and responsibility open to fficers who desire to take up this side of the Corps' luties. The inclusion of Officers of the Corps among hose officers who are now detailed to undergo courses t the School of Army Administration, Chisledon, is a tep of great importance in this connexion.

RATES OF PAY AND PENSION.

The following table shows the

Total Emoluments: Royal Army Medical Corps.

Appointment.	Pay.	Rations.	Servant.	Married and *Unmarried.** Lodging.	Fuel and light (average).	Furniture allowance.	Total (per annum).
	£ s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	£
ieutenant	1 2 0	1 11	2 0	3 6	1 10	2 0	606
				2 3	*1 6*		*541*
aptain ..	1 7 0	1 11	2 0	4 6	3 9	2 0	751
				3 0	*2 1*		*657*
After 6 yrs.	1 8 0	1 11	2 0	4 6	3 9	2 0	769
				3 0	*2 1*		*675*
,, 10 ,,	1 11 0	1 11	2 0	4 6	3 [illegible]	2 0	824
				3 0	*2 1*		*730*
ajor ..	1 15 0	1 11	2 0	4 6	3 9	2 0	897
				4 0	*2 11*		*836*
fter 15 yrs.	2 0 0	1 11	2 0	4 6	3 9	2 0	988
				4 0	*2 11*		*927*
ieut.-Col.	2 10 0	1 11	2 0	4 6	3 9	2 0	1171
				4 6	*2 11*		*1119*
fter 20 yrs.	2 12 6	1 11	2 0	4 6	3 9	2 0	1216
				4 6	*2 11*		*1164*
,, 25 ,,	2 15 0	1 11	2 0	4 6	3 9	2 0	1262
				4 6	*2 11*		*1210*
olonel ..	3 5 0	1 11	2 0	5 6	5 2	2 0	1488
				5 6	*3 6*		*1422*
ajor-Genl.	4 15 0	1 11	4 0	11 0	6 7	2 0	2199
				11 0	*4 8*		*2127*

* Rates for unmarried officers in italics.

The allowance rates vary slightly from time to time. harge pay (2*s.* 6*d.*–10*s.* per day) and specialist's pay (2*s.* 6*d.*– *s.* per day)—i.e., from £45–£180 per annum—in addition for considerable percentage of officers.

Retirement and Retired Pay.

The following are the rates of pension and retired ay :—

1. Retired pay will consist of two parts: (*a*) a service ement based on the officer's total service; (*b*) a rank ement for the rank from which the officer retires. An fficer with less than 20 complete years' service will not be igible for retired pay.

2. The scale will be as follows :—

(*a*) Service element.—£15 a year for each completed year of service.

(*b*) Rank element.—

Rank from which retired.	After completing 1 year's service in the rank.	After completing each additional year's service.	Maximum rank element.
	£	£	£
Major	12	12	120
Lieutenant - Colonel	150	30	240
Colonel	290	50	390
Major-General ..	440	50	540
Lieutenant - General	590	50	690

The retired pay of an officer retiring with less than one complete year's service in the rank from which he retires will be assessed as though he had retired from the rank below.

Maximum rates of retired pay (*a*) and (*b*) together :—

	£		£
Captain and Subaltern ..	300	Colonel	800
Major	450	Major-General ..	1000
Lieutenant-Colonel ..	600	Lieutenant-General	1200

Officers with 8½ and less than 20 years' service may be permitted to retire with a gratuity varying from £1000 to £2500.

Arrangements have been made for the appointment of Consultants in both Medicine and Surgery and the ranks of Colonel and Major-General will now be open to such Officers. The duties of these Officers are to visit all Commands and advise the Director-General, as the result of their inspections on the spot, with regard to the professional work being carried on in the hospitals, and the degree of efficiency attained by the personnel with whom they are respectively concerned. This should ensure a high standard of performance if only because of the satisfactory feeling that good work will not by accident remain unnoticed.

The present holders of these posts are Consultant in Surgery, Maj.-Gen. E. M. Pilcher, late Professor of Surgery at the Royal Army Medical College; Consultant in Medicine, Colonel J. C. Kennedy, late Professor of Tropical Medicine at the Royal Army Medical College.

THE ARMY DENTAL CORPS.

The Corps is administered by the Director-General, Army Medical Services. It is a joint service for the Army and Royal Air Force and personnel is required to serve under either force and be interchangeable. Officers and other ranks posted for duty with the Royal Air Force will perform their duties under the Regulations of the Royal Air Force for the employment of dental personnel, but the conditions in the following tables apply equally in either force. Promotion is carried out on one general list. The regulations for admission to the Army Dental Corps should be obtained from the Secretary, War Office, and carefully studied.

OFFICERS: *Appointment and Promotion.*

1. Commissions as lieutenants in the Army Dental Corps may be given to persons duly qualified under regulations approved by the Army Council.

2. An officer shall be eligible for promotion to the rank of captain on completion of three and a half years' service in the Corps provided he has previously qualified in such manner as may be prescribed by the Army Council.

3. Promotion to the rank of major and lieutenant-colonel to fill the establishments laid down from time to time for those ranks, shall be made by selection of the Army Council, provided the officer has previously qualified for promotion to those ranks in such manner [illegible] may be prescribed by the Army Council.

4. Certain appointments in the rank of lieutenant-colonel and major have been approved to fill the establishment. The remainder of the appointments are in the rank of lieutenant, except in cases where service of three and a half years or more has been given as a temporary dental officer when the rank of captain will be given. Service as a temporary dental officer will count towards the three and a half years for promotion to captain.

Pay.

The following are the rates for officers of the Army Dental Corps :—

	Per diem.		
	£	s.	d.
Lieutenant	1	0	
Captain	1	5	0
Captain, after 6 years' total service	1	6	6
Captain, ,, 10 ,, ,,	1	8	6
Major	1	13	0
Major, after 15 years' total service	1	18	0
Lieut.-Colonel	2	7	6
Lieut.-Colonel, after 20 years' total service	2	10	0
Lieut.-Colonel, ,, 25 ,, ,,	2	12	6

Allowances.

The allowances for officers of the Army Dental Corps are at the same rates as for officers of the R.A.M.C.

Retirement and Retired Pay or Gratuity.

(1) The rates of retired pay will be the same as for officers of the Royal Army Medical Corps.

(2) Voluntary retirement on retired pay will not be allowed until after twenty years' service.

(3) Earlier retirement on gratuity may be allowed :—

After 8½ years' service in the Corps, gratuity of	£1000.
,, 15 ,, ,, ,,	£1800.
,, 18 ,, ,, ,,	£2500.

(4) Retirement will be compulsory at the age of 55 years.

(5) A lieutenant who does not qualify for promotion within three and a half years' service in the Corps will be retired ; and a captain who fails to qualify for promotion to major within twelve years' service in the Corps will be retired on any gratuity for which he may be eligible under paragraph 3.

Other Ranks.

The rates of pay of warrant officers, non-commisioned officers and men are those provided in the Warrant of Sept. 13th, 1919, *vide* Army Order 324 of 1919.

The aim of the Corps is the prevention of wastage of man power on account of dental disease or dental deficiency, and, to enable this to be carried out, every recruit is inspected by a dental officer immediately after joining and all necessary treatment carried out. The soldier will be re-inspected at least once a year and his dental efficiency maintained at the best standard possible. As recruits are not now enlisted unless they have sufficient natural teeth to enable them to masticate efficiently it is hoped that the conservative nature of the treatment they will receive will reduce considerably the percentage of artificial dentures required.

The "other ranks" of the Corps consist of dental mechanics and clerk orderlies. Training of dental mechanics has been proceeding for some time at the Central Dental Laboratory, Aldershot, and it is not proposed to open recruiting at present for this section. A limited number of clerk-orderlies is now being enlisted, and these men receive their training at the Royal Army Medical Corps Depot.

INDIAN MEDICAL SERVICE.

THE Indian Medical Service differs from all the other State Services in that it combines the opportunities of a military and a civil career. It is primarily a military service, and all officers on first landing in India are detailed for service with Indian troops in Indian military station hospitals. After a period of military duty, which before the war varied from four to eight years, the majority of officers chose and were transferred to the civil side. While in civil employ they constitute the war reserve for the Indian Army. During the late war practically all officers not occupying administrative posts or filling essential civil duties were called up for military service.

The possibilities of medical and surgical work and the opportunities for research in all directions which the Service affords have always proved of great attraction, though in recent years the Service has lost its former popularity in the medical schools, and for some time prior to the war competition among highly qualified European candidates was not keen. Under the changed conditions in India the pay and emoluments were insufficient, and the terms of service were out of date. The pay, leave pay, pensions, and leave reserve have been increased recently, the Station Hospital system has been introduced, and command allowances and second in command allowances have been granted for charge of hospitals. These reforms have altered the outlook, and if they had been accompanied with a general change in the position of the British official in India, it would have been easy to say that young medical practitioners could join the I.M.S., secure of a competency from the day they receive their commissions ; but it is idle to conceal the fact that the officers of the I.M.S. may suffer, as all the other British officials in India are suffering, from the mutability of the conditions of life. The I.M.S. is bound to be affected as a career by the altered position of the district civil surgeon who used to enjoy private practice, with all its advantages, material and scientific, and who is now more confined to official work and less able to specialise in any line of medicine or surgery. The large and rising percentage of native officers in the Service of course affects the British competitor for commissions.

These things should be recognised as existent, though they do not alter the fact that in the Service a great career is open to one with the properties and keenness. Whatever may be the outlook in civil practice, the science of preventive medicine, medical research, and medical education must remain for a considerable period in the hands of the European, and we should be surprised to learn that any mass of educated native opinion thinks differently. Here, then, are three important fields of work open to the officer of the I.M.S., and if only on their account the career offered by the Service remains a large, interesting and important one.

During the first few years the young officer is trained in Indian military medical organisation. He acquires experience in dealing with the different races and castes which comprise the Indian Army. He learns the language and customs of the country. He familiarises himself with the practice of tropical medicine and surgery, and has leisure to pursue his further studies with time for recreation and sport in any direction his inclination may dictate. During these years he can make up his mind as to any special branch of study, and whether he is desirous of remaining in military employ throughout his service. Specialist appointments are available on both the military and civil sides.

On the civil side, and the majority of officers are civil surgeons in charge of districts and the civil district hospitals, the work is heavy and interesting, the bulk of it being surgery. There is no country in the world which offers better opportunity for the young surgeon once he has acquired the confidence and esteem of the inhabitants. Private practice is permitted, but it may be stated at once that the emoluments from this source, except in the Presidency or large towns, are much reduced. Nevertheless, with the pay as it now exists, plus certain minor allowances, the civil surgeon is in a position to live reasonably in his earlier years, and can expect to be selected for the higher professional posts as a reward of merit, when a lucrative practice may be obtained. I.M.S. officers are eligible for the professorships at the Medical Colleges in Calcutta, Bombay, Madras, Lahore, and Lucknow in the various subjects comprising the medical curriculum. The bacteriological, sanitary and chemical examinerships, and the work asylums and jail departments open out careers of a varied and valuable kind for those who wish to devote themselves to scientific research or specialist work. The bacteriological laboratories and Pasteur institutes at Kasauli, Bombay, Coonoor, Shillong, and Rangoon are splendidly equipped with provision for research workers. In addition to the scales of pay laid down, allowances are granted for service in these different directions.

Under the study-leave rules officers are entitled ring their service to a year's study-leave in England. is period counts as duty, and is in addition to rlough. It is granted on the basis of one month's ady-leave for each year's active service up to a tal maximum of 12 months. Most officers take it two periods of 6 months each, and add it on to their dinary furlough. During the period of study-leave ey are at liberty to pursue courses of approved ady in any country. They receive furlough pay is an additional lodging allowance of 12*s.* a day. e opportunity thus provided for continuing post-aduate studies for a period of six months twice in s service is invaluable both to the individual and e State.

Accelerated promotion of six months to the nk of major is granted to officers for approved ady or for obtaining the higher medical ualifications.

As regards leave, the Secretary of State has underken to increase the leave reserve to 25 per cent. and aintain a 2½ per cent. study-leave reserve in addition. iese percentages when worked up to are considered aple.

The Secretary of State has further undertaken that ficers of the I.M.S. on the military side will receive e same concessions as regards passages as combatant icers, while officers on the civil side will receive the me concessions, if any, as may be granted to other ficers in civil employ.

The rates of basic pay and pensions are given low :—

NEW RATES OF PAY.

(Given in rupees per mensem.)

Year of service.	Basic pay.	Overseas allowance.	Total basic pay and overseas allowance.	Rank.	Year of service.	Basic pay.	Overseas allowance.	Total basic pay and overseas allowance.
	Rs.	Rs.	Rs.			Rs.	Rs.	Rs.
				Major	13	950	250	1200
1	500	150	650		14	950	250	1200
2	500	150	650		15	950	250	1200
3	500	150	650		16	1100	250	1350
					17	1100	250	1350
4	650	150	800		18	1100	250	1350
5	650	150	800		19	1250	250	1500
6	650	150	800		20	1250	250	1500
7	750	200	950	Lieut.-Col.	21	1500	250	1750
8	750	200	950		22	1500	250	1750
9	750	200	950		23	1500	250	1750
10	850	200	1050		24	1600	250	1850
11	850	200	1050		25	1600	250	1850
12	850	200	1050		Over 25	1700	250	1950
					On S.L.	1850	250	2100

S.L.—Selected List.

Charge allowances and second-in-command allowces for station hospitals will be admissible in addition the above rates of pay at the following rates :—

(a) *Charge Allowance.*

	Rs. per mensem.
class hospitals ..	240
l class hospitals ..	180
l class hospitals ..	120
and 5th class hospitals	nil.

(b) *Second-in-Command Allowance.*

	Rs. per mensem.
1st class hospitals ..	120
2nd class hospitals ..	90

All existing general allowances paid to holders of ofessional and bacteriological appointments and rtain other special classes of appointments on the vil side will be maintained.

Indian officers who have joined or may join the rvice after Dec. 1st, 1918, will draw, as from Jan. 1st, '20, pay in accordance with the basic scale, unless ey are already drawing pay at a higher rate, in iich case they will continue to enjoy the benefit that rate for so long as they would otherwise ve done; but they will not receive any further crement until it is due to them under the basic ale.

PENSIONS.

The pension rates as now revised give £400 a year after 17 years' service, increasing to £800 after 27 years' service. Formerly the rate was £300 after 17 years' service, increasing to £700 after 30 years' service.

Pension Rates.

After 17 years' service ..	£400	After 23 years' service ..	£620
,, 18 ,, ..	430	,, 24 ,, ..	660
,, 19 ,, ..	460	,, 25 ,, ..	700
,, 20 ,, ..	500	,, 26 ,, ..	750
,, 21 ,, ..	540	,, 27 ,, ..	800
,, 22 ,, ..	580		

Additional pensions for administrative officers :—

Colonel, after two years' active service as such	£125
After four years	250
Major-General, after one and a half years' active service as such	300
After three years	350

It is quite impossible to foretell how and to what extent the civil side of the I.M.S. will be affected by the Indian Reform scheme, the essence of which is the increasing participation of Indians in the government of the country. None the less, we consider it right to draw the attention of young medical men who are considering joining the Indian Medical Service to this aspect. At the same time we see no reason why the increased coöperation of Indian and European medical officers should not, if a sympathetic attitude is adopted, result in the benefit of both. The number of Indians in the I.M.S. in the days of the competitive examination varied from 8 to 12 per cent. In the two or three years before the war the percentage of successful Indian candidates varied from 12 to 30 per cent. At the present time European and Indian candidates are admitted by nomination in the proportion of 2 Europeans to 1 Indian. A strict system of selection is maintained and permanent commissions are only granted to candidates, whether Europeans or Indians, who have been recommended after a personal interview as suitable and desirable professionally and socially. Practically all the Indian candidates recommended so far have served in the field with distinction and have been recommended by two of their brother officers for the grant of a permanent commission.

A Board of Selection has been appointed in India for the recruitment of permanent officers for the I.M.S. in the manner indicated, consisting of the Director-General, I.M.S., the Director of Medical Services in India, and an Indian Officer, I.M.S. Candidates who may be summoned by the Board for interview will, if considered suitable for appointment, be placed in one of two classes, according as they have or have not received their medical education chiefly in England. The final recommendations as to the former will be made by the Selection Board in England, while the recommendations as to the latter will be sent direct from India to the Secretary of State, who will make appointments to fill the vacancies. The Selection Committee in England, in addition to considering applications from India of candidates who have mainly received their education in England, will review those of the candidates in the United Kingdom, but not the recommendations of the India Committee in regard to candidates educated in that country.

For full particulars intending candidates should apply to the Secretary, Military Department, India Office, Whitehall, London, S.W. 1.

WOMEN'S MEDICAL SERVICE FOR INDIA.

THIS service is open to fully qualified medical women of British or Indian nationality who desire to carry on work in India. Medical women proceeding to India to join the Women's Medical Service receive a sufficient sum for a first-class passage to India. On landing they are posted to one of the larger women's hospitals to gain Indian experience and to learn the language. During this period (from six months to two years) private practice is not allowed. For a further period they are appointed to act temporarily for medical women on furlough, during which time private practice is allowed. They are then definitely appointed to the charge of hospitals. Private practice is always allowed after the first two years, provided it does not interfere with official duties. The only exception is in administrative or educational posts, when an allowance in lieu of practice is given. The amount obtained from practice varies according to the station, but in most cases it forms a fair addition to the salary, varying from £150 to £1000 a year.

Excellent opportunities for surgery—especially gynæcological—are found in the Women's Medical Service. To those who are not keen surgeons opportunities are likely to open in the future in connexion with maternity and child welfare; medical women with administrative ability are also needed for the inspection of women's hospitals and other medical institutions.

Rates of pay are [illegible] follows :—

Years of service.	Overseas allowance per mensem.	Salary per mensem.	English equivalent* per annum.
1 to [illegible]	Rs.100	Rs.450	£440
4 to 6	,,	Rs.500	£480
7 to 9	,,	Rs.550	£520
10 to 12	,,	Rs.600	£560
13 to 15	Rs.150	Rs.650	£600
16 to 18	,,	Rs.700	£640
19 to 21	,,	Rs.750	£680
22 to 24	,,	Rs.800	£720
over 24	,,	Rs.850	£760

* At rupee value 1*s*. 4*d*.

The above rates of pay are not so high as those of the Indian Medical Service. The fact, however, that furnished quarters are provided (these are not provided in the Indian Medical Service) represents an additional Rs.150 per mensem. Moreover, the official duties of the members of the W.M.S. are lighter than those of the I.M.S.

The cost of living in India is much higher than formerly, but it should be possible for a medical woman (with house provided) to meet actual household expenses for about Rs.200 per mensem, leaving the remainder of her salary for dress and personal expenses. To this must be added the necessary saving to meet additional expense for furlough and leave spent in the hills.

One month's privilege leave on full pay is granted each year. Furlough on half-pay at the rate of two months for every year of service is granted after every three years. Study-leave on two-thirds pay is granted to the extent of 12 months in the total service. There is a provident fund to which members of the service contribute 10 per cent. of their pay. The service contributes another 10 per cent. which accumulates at interest and is repaid on retirement.

Admission to the service is made by selection. Candidates in the United Kingdom should apply to the Hon. Secretary, United Kingdom Branch of the Countess of Dufferin's Fund, care of Sir Havelock Charles, India Office, Whitehall, London.

AIR FORCE MEDICAL SERVICE.

THE Royal Air Force Medical Service offers a career for medical men which should prove both attractive and interesting. The rates of pay and allowances are good, and a new field of scientific interest is opened up by the manifold problems which the circumstances of aviation produce. The physical and mental fitness for, and reaction to, the varied conditions under which the flying personnel perform their functions provide much scope for research. As promotion to the higher ranks of the Service is to be entirely by selection, and as [illegible] certain proportion of the higher ranks will be reserved for purely scientific, [illegible] opposed to administrative, appointments, it will be seen that there are excellent prospects for the young medical officer who exhibits ability and energy in scientific research, as well as for those who develop a talent for administration.

The establishment will consist partly of permanent and partly of short-service officers. Short-service officers will be admitted by direct entry for a period of two years, which may be extended to four years at the discretion of the Air Council on recommendation of the Director of Medical Services. Those who are not selected for permanent commissions will pass into the Royal Air Force Medical Reserve at the expiration of their period of service on the active list, and will then receive the gratuity to which their service entitles them.

Short-service officers who are approved for permanent commissions, but for whom there are not vacancies in the Royal Air Force Medical Service, may, under certain conditions, transfer to the Royal Army Medical Corps, counting their time served in the Royal Air Force towards increments of pay and retired pay in the Royal Army Medical Corps.

Officers who have been selected for permanent commissions will be granted leave for a period not exceeding nine months for post-graduate study in general medicine and surgery, tropical and preventive medicine, and other special subjects. Such leave will be granted during the first six years of permanent service, and during such leave officers will remain on full pay and allowances.

New entrants into the Royal Air Force Medical Service will be commissioned as Flying Officers (Medical) and will be eligible for promotion to the rank of Flight Lieutenant (Medical) after two years' service. Officers selected for permanent commissions will be promoted to the rank of Squadron Leader after 10 years' total service. Accelerated promotion may be carried out, in a limited number of cases, of officers who show exceptional ability after the completion of eight years' service. Promotion to the rank of Wing Commander will be by selection at any period after 16 years' total service, and to that of Group Captain by selection at any period after 22 years' service.

There will be no competitive examination on entry; candidates must be under 28 years of age, be nominated by the Dean of a recognised medical school or teaching hospital, and will be interviewed personally by the Director of Medical Services, Royal Air Force, before acceptance. Each candidate must produce—

1. Birth certificate.
2. Medical registration certificate.
3. A declaration containing the following information :—

(*a*) Age and place of birth.

(*b*) That he is of pure European descent, and the son of a subject of the British Empire.

(*c*) That he labours under no constitutional or mental disease or disability which may interfere with the efficient discharge of the duties of a medical officer in any climate in peace or war. (All candidates will be required to pass a medical examination as to their physical fitness before acceptance to ensure that they fulfil the standard laid down in this declaration.)

(*d*) That he is ready to engage for general service at home or abroad as required.

(*e*) The qualifications he is possessed of, and what medical or other appointments he has held (if any).

(*f*) That he is willing to fly whenever called upon to do so, and to qualify in such aviation tests as may be required.

If the applicant is in possession of a certificate of training in an Officers' Training Corps this should be submitted.

An applicant who at the time of application holds, or is about to hold, a resident appointment in a recognised civil hospital may be seconded for the period not exceeding one year, during which he holds such appointment. Whilst seconded he will not receive pay from Air Council funds, but his seniority will count from the day on which he is seconded to the civil hospital.

Uniform and Equipment.

Medical officers will be required to provide themselves with the uniform of their rank and with the distinguishing badges of the Royal Air Force Medical Service. They will be required to provide themselves with service dress and mess dress. The provision of full dress is entirely optional.

An outfit allowance of £50 will be granted to officers if they have had no previous commissioned service.

If they have had previous commissioned service in the Royal Navy, the Army, or the Royal Marines, but not in the Royal Air Force, they will receive an outfit allowance of £25.

Officers on entry are required to provide themselves with the regulation pocket case of instruments.

RATES OF PAY AND RETIRED PAY.

The rates of pay are as given below :—

Years of service.	Rank.	Rate per diem.
		s.
On joining	Flying Officer.	24
On promotion	Flight Lieutenant.	26
After 2 years in the substantive rank	,,	28
,, 4 ,, ,, ,, ,,	,,	30
On promotion	Squadron Leader.	34
After 2 years in the substantive rank	,,	36
,, 4 ,, ,, ,, ,,	,,	38
,, 6 ,, ,, ,, ,,	,,	42
On promotion	Wing Commander.	46
After 2 years in the substantive rank	,,	50
,, 4 ,, ,, ,, ,,	,,	52
,, 6 ,, ,, ,, ,,	,,	54
On promotion	Group Captain.	60
After 2 years in the substantive rank	,,	64
,, 4 ,, ,, ,, ,,	,,	68

Rates of pay in India :—

	Rupees per mensem.		Rupees per mensem.
Flying Officer ..	650	Squadron Leader ..	1050
Flight Lieutenant ..	750	After 2 years ..	1100
After 2 years ..	850	,, 4 ,, ..	1150
,, 4 ,, ..	900	,, 6 ,, ..	1250
		Principal Medical Officer	1950

The scale of retired pay for Group Captains and lower ranks is given below :—

Age.	Service counting for retired pay.	Rate of retired pay.	Addition for each extra year of service.*	Reduction for each deficient year of service.*
		£	£	£
55	24	790	22	15
54	24	765	22	15
53	23	742	22	15
52	23	720	22	15
51	22	697	22	15
50	22	675	15	15
49	21	637	15	15
48	21	600	15	15
47	20	562	15	15
46	20	525	15	15
45	19	487	15	15
44	19	450	15	15
43	18	412	15	15
42	18	375	15	15
41	17	337	15	15
40	17	300	15	15

* Limited to five years.

Group Captains retire at 55; maximum retired pay £900.
Wing Commanders retire at 51; maximum retired pay £600.
Squadron Leaders retire at 48; maximum retired pay £500.

There will be a minimum qualifying period for retired pay of 20 years.

Gratuities.

Short-service officers will receive gratuities at the rate of £100 for each of the first two completed years of service, and at the rate of £150 for the third and fourth completed year. (If granted permanent commissions these gratuities will not be payable, but the period of service under the short-service commission will count for retired pay.)

Medical officers holding permanent commissions may, at the discretion of the Air Council, be allowed to withdraw from the Service after ten years' service with a gratuity of £1250 or after 16 years with a gratuity of £2000 in lieu of retired pay.

Allowances.

The usual allowances will be payable to medical officers under the same conditions as to officers of other branches of the Royal Air Force.

The dental service of the Royal Air Force is a part of the Army Dental Corps (see p. 419).

COLONIAL MEDICAL SERVICE.

IN the self-governing dominions, Canada, Australia, New Zealand, the Union of South Africa, and Newfoundland, and territories under their control, such as Papua and the Cook Islands, medical appointments are made concerning which information can be obtained from the High Commissioners or Agents-General in London; appointments in Egypt and the Soudan are regulated from the Foreign Office; in Rhodesia the appointments are made by the British South Africa Company, London Wall Buildings, E.C.; in North Borneo application should be made to the British North Borneo Company, 37, Threadneedle-street, E.C., for appointments; and those in Sarawak are in the hands of H.H. the Rajah.

As a general rule, each Colony or Protectorate has its own public service distinct from that of every other; and it is usually only the higher officers who are transferred by the Secretary of State from one Colony to another. There are two exceptions to this rule: (*a*) The West African Medical Staff, which serves Nigeria, the Gold Coast, Sierra Leone, and the Gambia, is one service. (*b*) In practice the medical services of the Straits Settlements and the Malay States may be regarded as one, as the officers may be and frequently are transferred from the Colony to the States or vice versa.

The Colonies, Protectorates, and Mandated Territories to which medical officers are appointed by the Secretary of State for the Colonies are (*a*) the West African—viz., Nigeria, the Gold Coast, Sierra Leone, and the Gambia; (*b*) the East African—viz., the Kenya Colony and Protectorate, the Uganda, Nyasaland, Somaliland, and Zanzibar Protectorates, and the Tanganyika Territory; (*c*) the Eastern—viz., Ceylon, the Straits Settlements and Malay States, Hong Kong, Mauritius, and Seychelles; (*d*) the West Indian—viz., British Guiana, Jamaica, Trinidad, the Windward Islands, the Leeward Islands, Barbados, British Honduras, and the Bahamas; (*e*) Fiji and the Wester Pacific, Cyprus, Malta, Gibraltar, St. Helena, Bermuda, and the Falkland Islands; and (*f*) Palestine.

In Ceylon, Mauritius, Jamaica, Barbados, the Bahamas, and Bermuda vacancies are practically always filled locally by the appointment of qualified native candidates, or—in the case of some of the higher posts—by transfer from other Colonies. Appointments in Malta are all filled locally. Vacancies occur most regularly and frequently in the West African Medical Staff, the East African Medical Service, and the Straits Settlements and Malay States.

All applicants for medical appointments in the gift of the Secretary of State for the Colonies should be between the ages of 23 and 35,[1] and must be doubly qualified; preference will be given to those who have held hospital appointments as house physicians and house surgeons; testimonials to character and professional competence will be required, and every officer before being definitely appointed will be medically examined by one of the consulting physicians of the Colonial Office: Sir J. Rose Bradford, 8, Manchester-square, London, W. 1; Sir J. Hawtrey Benson, 57, Fitzwilliam-square, Dublin; Lieut.-Colonel J. Arnott, I.M.S., 8, Rothesay-place, Edinburgh; and Dr. R. H. Kennan, 2, St. James's-road, Liverpool. Applications for such appointments must be addressed to the Assistant Private Secretary (Appointments), Colonial Office, Downing-street, S.W. 1.

EAST AFRICAN MEDICAL SERVICES.

Medical officers in the Kenya Colony and Protectorate and the Uganda, Nyasaland, Somaliland, and Zanzibar Protectorates, and the Tanganyika

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[1] In the case of East Africa, preference will be given to candidates who are over 25 years of age. In the case of Fiji and the Western Pacific, preference will be given to candidates who are under 30. At the present time, however, no definite age-limits are insisted on; but officers over the age of 35 must be prepared to serve, if required, on a temporary and non-pensionable footing.

Territory are appointed on probation in the first instance for two years, at the end of which period their appointments are made permanent if their service has been satisfactory. Unless the Secretary of State directs to the contrary, they are required to attend a course of instruction at the London or Liverpool School of Tropical Medicine before taking up their appointments. If such a course is not taken before proceeding to East Africa, they are required to take it during their first leave of absence. Medical officers (but not medical officers of health) are permitted to take private practice, on the understanding that they give precedence to their official duties. It must be understood that, as a general rule, additions to their income from this source are not likely to be substantial.

The currency in different Dependencies in East Africa varies. In Kenya, Uganda, and the Tanganyika Territory, an East African shilling (one-twentieth of a pound sterling) is the standard coin. Salaries and sterling allowances are issued locally in respect of resident service at a fixed rate of 20 shillings to the pound sterling. A special local allowance, at the rate of 25 per cent. of sterling salaries and allowances, was to be paid on all salaries and allowances issued in respect of resident service up to March 31st, 1923. After that date the allowance was reduced to an average of 15 per cent. of sterling salaries and allowances issued in respect of resident service, but it is proposed to arrange for the adoption of a sliding scale giving a larger percentage of local allowance on low salaries than on high salaries. The question of the continuance or otherwise of the allowance will be subject to review on March 31st, 1924. In Zanzibar and Somaliland the Indian rupee is the standard coin, and for the present sterling salaries and allowances are issued at a fixed rate of 15 rupees to the pound. No local allowance is paid. In Nyasaland sterling currency is used, and no local allowance is paid.

Medical officers are provided with quarters free of rent (but not of rates or other similar outgoings), if quarters are available; if quarters are not available, the Governor may provide temporary accommodation or alternatively, at the discretion of the Government, an allowance in lieu of quarters calculated at 15 per cent. of the initial salary of an officer's appointment. The salary of a medical officer is £600 per annum, rising by annual increments of £25 to £900 per annum, with efficiency bars at £700 and £800.

Medical officers in East Africa are permitted to retire with gratuity, if they wish, instead of waiting to retire on pension as follows: (*a*) After nine years' service, of which at least six must have been spent in East Africa, £1000; (*b*) after 12 years' service, of which at least eight must have been spent in East Africa, £1250. If an officer elects to retire with gratuity, he thereby forgoes all claim to pension.

The grades and salaries (apart from ordinary medical officers) in the medical departments are as follows :—

Kenya : Principal Medical Officer, £1200 ; Deputy Principal Medical Officer, £1000 ; Principal Sanitation Officer, £1000 ; Resident Surgeon, Nairobi European Hospital, £900–50–1000 ; Senior Medical Officers, £800–25–900 ; Sanitation Officers, £800–25–900 ; Bacteriologist, £900–50–1000 ; First Assistant Bacteriologist, £800–25–900 ; Second Assistant Bacteriologist, same scale as Medical Officer.

Uganda Protectorate : Principal Medical Officer, £1200 ; Deputy Principal Medical Officer, £1000 ; Principal Sanitation Officer, £1000 ; Specialist Officer for Anti-Venereal Measures, £1000 ; Sanitation Officer, £800–25–900 ; Senior Medical Officers, £800–25–900 ; Bacteriologist, £900–50–1000 ; Assistant Bacteriologist, same scale as Medical Officer.

Nyasaland Protectorate : Principal Medical Officer, £1000. Senior Medical Officer, £800–25–900 ; Sanitation Officer, £800–25–900.

Zanzibar Protectorate : Principal Medical Officer, £1000 ; Senior Medical Officer of Health, £800–25–900.

Somaliland Protectorate : Senior Medical Officer, £800–25–900.

Tanganyika Territory : Principal Medical Officer, £1200 ; Deputy Principal Medical Officer, £1000 ; Senior Sanitary Officer, £1000 ; Director of Laboratory, Dar-es-Salaam, £800–25–900 ; Senior Medical Officers, £800–25–900.

The medical officers of health are usually selected from the medical officers in the permanent establishment. They receive special non-pensionable allowances of £50 or £100 a year according to station.

ASIA.

Straits Settlements and Federated Malay States.—European medical officers are appointed on the following scale of salaries: $440 per mensem, rising to $480 per mensem during three years' probation; then, if they are placed on the pensionable establishment, rising to $500 per mensem, and thence by annual increments of $25 per mensem to $800 per mensem, with a strict efficiency bar at $600 per mensem. This scale of salaries has been fixed on the supposition that medical officers join the service at about the age of 27. Above the concluding figure of $800 per mensem there are certain higher appointments as follows: Principal Civil Medical Officer, Straits Settlements, and Principal Medical Officer, Federated Malay States, $1200 per mensem. Class A: seven posts at $1050 per mensem. Class B: seven posts at $850, rising by $30 to $1000 per mensem.

The following temporary allowances are at present paid to all officers recruited from Europe in the Government Services of the Straits Settlements and Federated Malay States: unmarried officers, 10 per cent. of salary; married officers, 20 per cent. of salary. Private practice by Government medical officers is not allowed. They may, however, do, and receive fees for, consultative work, under conditions approved by the Government. Information about general conditions in Malaya is obtainable from the Malay States Information Agency, 88, Cannon-street, E.C. 4.

Seychelles.—The chief medical officer receives Rs.6000 and Rs.300 in fees. There are two assistant Government medical officers, one receiving Rs.5500 and Rs.500 house allowance, and one receiving Rs.5000. A small permanent increase of 5 per cent. on these salaries has been given as from Jan. 1st, 1921.

Hong-Kong.—The present establishment of the medical department is: principal civil medical officer, £1000–£50–£1200 ; five medical officers, £600–£25–£1000; health officer of the port, £600–£25–£1000 ; second health officer of the port, £600–£25–£1000; bacteriologist, £700–£25–£1000. A temporary allowance on a scale varying with the sterling exchange value of the dollar is at present payable. Salaries are converted locally at the rate of 2*s.* = $1. Free quarters are not provided, but in certain instances a rent allowance is paid by the Government.

AMERICA.

British Guiana.—There are the following posts in the medical service of the Colony: one surgeon-general, £1000 per annum, with consulting practice; one bacteriologist and pathologist, £450–£700 (increment £50), with £50 allowance in lieu of fees; six medical officers at £900 ; eight medical officers at £600–£700 ; 20 medical officers at £500–£600. Some of the senior posts also carry duty allowances (varying from £50 to £300 per annum) and quarters. All the junior appointments in which private practice is not allowed carry duty allowances. Private practice is allowed in certain cases.

Trinidad and Tobago.—In Trinidad and Tobago there are over 40 appointments. Under the terms of the Ordinance regulating the medical service, officers are appointed in the first instance on two years' probation as supernumeraries and are eligible for appointment as Government medical officers at the end of this period. Supernumeraries receive a salary of £400 per annum with furnished quarters, and are usually attached to the Government hospital. Government medical officers receive salary at the rate of £400 per annum with annual increments of £25 accruing from the date of first appointment as supernumerary medical officers, until reaching the maximum of £600. Most are employed as district medical officers, with private practice, a residence or a rent allowance of £50, a horse allowance or motor allowance averaging £110 (except in one district). Officers employed in institution work receive allowances in lieu of private practice varying from £50 (and furnished quarters) to £300. In no case therefore do the emoluments on first appointment amount to less than £550 a year and furnished quarters. In a few districts a system has been introduced by which the work is performed by private practitioners under temporary contracts. There is good scope for private practice in all medical districts. Medical officers having completed 10 years' resident service are pensionable at the age of 55.

Windward Islands (Grenada, St. Lucia, St. Vincent).—There are over 25 appointments. The colonial surgeon, Grenada, receives £650–£800. The chief medical Officer, St. Lucia, receives £600–£700 plus forage and subsistence allowances; the post is pensionable, but private practice is not allowed except as a consultant. Most of the remaining appointments are district appointments with the right to private practice attached; the salaries paid by Government vary from £315–£420, and with allowances in certain cases. The Governor has the power to transfer a medical officer from one island to another at his discretion. The appointments are pensionable.

Leeward Islands (Antigua, St. Christopher and Nevis, Dominica, Montserrat, Virgin Islands).—The appointments are of the same nature as in the Windward Islands and are pensionable. An officer when first sent out is not appointed to a particular island but to the service of the Leeward Islands, with a salary varying from £312 to £400, according to station, and the Governor decides as to the district which is to be allotted to him. He is liable to be transferred at the Governor's discretion to any medical district in the Leeward Islands, and in certain districts may be required to perform magisterial duties. The medical officers receive fees for successful vaccinations, post-mortem examinations, attendance and giving evidence at courts of justice, certificates of lunacy, and, in the larger islands, for burial certificates. They are also as a rule, allowed private practice. The chief medical officer, St. Kitts, receives £700–£25–£750 without private practice.

British Honduras.—There are seven medical appointments (besides the principal post of colonial surgeon) at a salary of $2430 per annum. Unless they already possess a diploma of public health, medical officers are liable to be required, before they join the colony, to undergo a course of instruction at a laboratory of public health or analogous institution. The value of the dollar is approximately the same as that of the United States dollar.

OTHER OVERSEAS APPOINTMENTS.

Fiji and the Western Pacific.—In Fiji the Government medical officers receive a salary of £400, rising by annual increments of £25 to £600, with partly furnished quarters, or a house allowance of £50. In some districts a medical officer is also a district commissioner, with an additional allowance of £150. They are allowed private practice, on the understanding that their official duties are not neglected. Private practice, however, cannot be guaranteed, and in most districts it is very small in amount. Where no private practice exists, a duty allowance of £50 is granted. They are required either to take charge of hospitals or of districts, at the discretion of the authorities. The posts are pensionable.

In addition to a chief medical officer (£800 a year, rising to £1000), a resident medical officer, Colonial Hospital (£650–£900, inclusive of allowances as medical officer of health and officer in charge of the Medical School), and a medical superintendent, Makogai Leper Asylum (£600 rising to £800), there are in Fiji 11 medical officers, five of whom are also district commissioners. The staff in the British Solomon Islands Protectorate consists of one senior medical officer (£650 rising to £750) and two medical officers (£550 rising to £650). In the Gilbert and Ellice Islands Colony there is one medical officer in charge (£650 rising to £750). Officers may be transferred from Fiji to the Western Pacific at the discretion of the Secretary of State.

Cyprus.—There is a chief medical officer paid at the rate of £750, rising by annual increments of £25 to £900, and three district medical officers paid at the rate of £500 a year, rising by annual increments of £20 to £600 a year, all enjoying private practice (except the chief medical officer, who is allowed consulting practice only) and receiving 2*s.* per diem forage allowance. There is also a medical officer of health on £600, rising by £20 increments to £720 without private practice; these are the only medical appointments in the island which are open to English candidates.

Gibraltar.—There is a surgeon of the Colonial Hospital receiving £750, and private practice. There are also two assistant surgeons with a salary of £720 per annum, who are allowed private consulting practice only. Free quarters, unfurnished, are provided for all three officers.

St. Helena.—The colonial surgeon at present receives £300 per annum, £20 fees as health officer, and £30 horse allowance. Private practice is allowed. A temporary bonus of 20 per cent. is at present being paid to the colonial surgeon, who further receives an allowance of £67 per annum from the Administration. The assistant colonial surgeon at present receives £550 a year and a horse allowance, but the salary may be revised on the occurrence of a vacancy. No private practice without special permission of the Governor.

Falkland Islands.—There are two appointments. The colonial surgeon is paid at the rate of £600 per annum, with free furnished quarters. The assistant colonial surgeon is paid at the rate of £500 per annum, with an allowance of £50 per annum in lieu of quarters. Private practice is shared between the colonial surgeon and the assistant colonial surgeon. The office of colonial surgeon is pensionable.

Palestine.[2]—The grades and salaries of superior appointments in the Department of Health are: Director, £E1100–50–1400, plus £E100 expatriation allowance. Deputy director, assistant director (laboratory section), and principal medical officer (Jerusalem district) £E800–50–1100 plus £E100 expatriation allowance. Deputy assistant director, chemical analyst, assistant bacteriologist and entomologist, four principal medical officers (remaining three districts and railway staff), and assistant principal medical officer (Jerusalem district) £E550–25–750 plus £E50 expatriation allowance. The remainder of the staff is recruited locally.

LEAVE AND PENSIONS.

Leave and Passages.—Leave of absence in East Africa on full salary is granted in the normal case after a tour of residential service (of not less than 20 and not usually more than 30 months) to an amount of five days for each completed month of residence (or 2½ days when for any reason the officer is not returning to East Africa) exclusive of the periods of the voyages to and fro, for which full pay is also given. Officers serving in Uganda, Zanzibar, and the Tanganyika Territory, or in certain stations in Kenya and Nyasaland, are allowed six (or three) days' leave in respect of each month of service instead of five (or 2½) days' leave respectively. In Somaliland special leave regulations exist which provide for an officer taking leave after a shorter tour of service than in other parts of East Africa. Free first-class passages are provided for the officer on first appointment and on leave.

In the Malay Peninsula two months' leave of absence with full salary may be granted in respect of each year's service, and this leave may be accumulated up to a maximum of eight months. Additional leave on half-pay may be granted on special grounds. Up to the end of 1923 free passages are granted on first appointment and on leave, but the continuance of this privilege beyond that date is uncertain; but free passages on first appointment or transfer are granted permanently for officers with salary under £800 per annum.

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[2] £1 Egyptian (of 100 piastres) is equivalent to £1 0*s.* 6*d.* sterling.

In other Colonies outside Tropical Africa, subject to the necessities of the service, leave of absence on half salary may be granted after a period of six years' resident service without any special grounds. It may be given before the expiration of that period in case of serious indisposition, or of urgent private affairs. In the absence of special grounds, the leave must not exceed one-sixth of the officer's resident service; on special grounds it may exceed that period by six months. In addition to the above, vacation leave on full pay may be granted, if no inconvenience or expense is caused thereby, not exceeding three months[3] in any two years. In British Guiana officers are allowed to accumulate full-pay leave at the rate of six weeks for each year's service up to six months, and no leave of absence may (except in very special circumstances) exceed six months in all unless the officer has served for five years or more without leave, in which case two months on half-pay leave may be taken in addition to six months' full-pay leave.

On first appointment an officer whose salary and fees together do not exceed £800 a year will, except in the case of a few Colonies possessing Representative Assemblies, be provided by the Crown Agents for the Colonies with free passages to the Colony for himself and his wife and children, if any, not exceeding four persons besides himself. The officer so appointed will be required to execute an agreement binding him to repay the cost of the passage or passages so obtained in the event of his leaving the Government service within three years. An officer taking leave out of the Colony has in most cases to provide his own passages.

Pensions.—Officers on the pensionable establishment retire on attaining the age of 50 years or after 20 years' East African service, whichever is earlier; but they may be retained in the Service, with their own consent, for such further period as the Government may recommend. Earlier retirement in the event of ill-health is also provided for. Pension is computed at one-sixtieth of pensionable emoluments —i.e., salary and value of free quarters[4]—at the time of retirement, two years' service being reckoned as three years for this purpose, subject to an average of emoluments for the last two years before retirement instead of the actual emoluments at the time of retirement being taken as the basis for calculation in certain circumstances.

In most of the other Colonies an officer holding a pensionable appointment may be allowed in the case of ill-health to retire on a pension after ten full years' resident service; otherwise he must have attained the age of 55. For ten full years' resident service fifteen-sixtieths of the average annual salary of the retiring officer's fixed appointments for three years prior to retirement may be awarded, to which one-sixtieth may be added for each additional year's service; but no addition will be made in respect of any service beyond 35 years. For pension purposes absence on vacation leave counts as full service, and leave on half-pay as half service. In a few cases the retiring age is 60 and the pension after ten years' service is ten-sixtieths instead of fifteen. In the Straits Settlements and Malay States, an officer may, with the consent of Government, retire at age 50. Pensions are calculated on a basis of length of service in months instead of years.

WEST AFRICAN MEDICAL STAFF.

Applicants for appointment as medical officers in the West African Medical Staff (the higher grades will usually be filled by promotion from the lower) must be British subjects of European parentage and between 23 and 35 years of age; preference is given to candidates who are over 25 years of age. Applicants must possess a complete double qualification, and must be on the Medical Register. Passages for wives and children are not provided by the Government, and houses for the wives of junior medical officers are rarely available. Officers are not allowed to take their wives and young children out with them until they have acquired experience of the local conditions and have obtained the sanction of the Governor; and permission to bring out young children will only be given in the most exceptional circumstances.

Candidates whom it is proposed to select for appointment will have to be medically examined by one of the medical advisers of the Colonial Office (or, in the case of those residing in a Colony, by a medical officer appointed by the Colonial Government), and no appointment will be made unless the candidate is declared to be physically fit for service in West Africa. Candidates are allowed to express a preference for any particular Colony or Protectorate, and their wishes in this respect will be borne in mind and met as far as possible, but they are liable to be posted in the first instance, or transferred afterwards if necessary to any other West African Colony or Protectorate at the discretion of the Secretary of State. Candidates who wish to be posted to the Northern Provinces of Nigeria should be able to ride. Transfers from one Colony or Protectorate to another will be made as seldom as possible. They should on no account apply for, or accept, a West African appointment in the expectation of ultimately being transferred elsewhere, as the number of such transfers is exceedingly small.

Officers of the West African Medical Staff who may be transferred to pensionable appointments under the Crown elsewhere than in West Africa do not forfeit their claim to pension in respect of their West African service on final retirement, provided that they have been members of the staff for at least 12 months. Every officer selected for appointment is required to have himself revaccinated before proceeding to West Africa, unless one of the medical advisers of the Colonial Office certifies in any particular case that this is unnecessary.

Instruction in Tropical Medicine.—Every candidate selected for appointment will, unless the Secretary of State decides otherwise, be required to undergo a course of instruction for two or three months, either at the London School of Tropical Medicine, Endsleigh-gardens, Euston-square, N.W. 1, or at the Liverpool School of Tropical Medicine, University, Liverpool. The cost of tuition will be borne by the Government, but candidates must make their own arrangements for board and lodging; an allowance of £3 a week will be paid to them monthly in arrear for this purpose. A daily allowance of 5*s.* (but no salary) will be paid to each candidate monthly in arrear during the course, and may be continued subsequently up to the date of embarkation. He will be bound to refund them (1) if he declines to accept an appointment in any of the Colonies or Protectorates for which he may be selected by the Secretary of State; (2) if he fails to obtain a certificate in regard to progress and efficiency, or (3) if he relinquishes the West African Service for any other reason than mental or physical infirmity, or is removed for misconduct, within three years of the date of his arrival in West Africa.

If at the end of the session there exists no vacancy in the Staff to which a candidate can be appointed, he will be placed in a Reserve and granted an allowance at the rate of £200 a year until the occurrence of a vacancy.

Leave of Absence.—European officers in West Africa may be granted vacation leave on full salary not exceeding in all one week's leave in the United Kingdom for every completed calendar month of total residential service in West Africa, plus the time necessarily taken on the journey to the United ingdom, and, if the officer is returning to West frica for further service, the time necessarily taken n the journey from the United Kingdom to the olony. Vacation leave may be granted without any pecial grounds after 18 consecutive calendar months of esidential service in West Africa. An officer will ot be required to serve a tour of more than 24 onsecutive calendar months' residential service xcept in special circumstances; and the Governor ay grant vacation leave to any officer at any time fter he has completed 12 consecutive calendar onths' residential service. Vacation leave on full alary may also be granted to an officer if he is invalided om West Africa after less than 12 consecutive alendar months' residential service, and sick leave n full salary may be granted for any period not xceeding six calendar months.

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[3] Or, in the case of Fiji and the Western Pacific and the Falkland Islands 4½ months in any three years.

[4] The value of free quarters for pension purposes is normally taken as 15 per cent. of the minimum salary of the grade in which [illegible] officer is serving at the time of retirement; but [illegible] a special temporary concession it will be taken [illegible] 30 per cent. of such salary in the cases of officers retiring on or after Jan. 1st, 1922. This arrangement will be liable to review after it has been in force for two years.

Appointments and Salaries.—The Medical Services f the West African Colonies and Protectorates—amely, the Gambia, Sierra Leone, the Gold Coast ncluding Ashanti and the Northern Territories), and igeria (Southern and Northern Provinces)—form one ervice under the name of the West African Medical taff. All the medical officers for the service are elected by the Secretary of State for the Colonies, nd are on one list for employment and promotion. he grades and emoluments of the Staff are at present s follows:—

The Director of the Medical and Sanitary Service, Nigeria, eceives a salary of £1800 a year, with a duty allowance at he rate of £360 a year. The Director of Medical and anitary Service in the Gold Coast receives a salary of 1600 a year, with a duty allowance at the rate of £320 a ear. The Director of Medical and Sanitary Service in ierra Leone receives a salary of £1400 a year, with a duty llowance at the rate of £280 a year. The Deputy irector of Medical and Sanitary Service, Nigeria, and the eputy Director of Sanitary Service, Nigeria, receive salaries f £1500 a year, with duty allowances at the rate of £300 a ear. The Deputy Director of Medical and Sanitary Service, old Coast, receives a salary of £1400 a year, with duty allowance at the rate of £280 a year. Assistant Directors Medical ervice: There are nine appointments on this grade, six in igeria, two in the Gold Coast, and one (with the title of eputy Director Medical Service) in Sierra Leone. The alary is at the rate of £1300 a year, with duty allowance at he rate of £260 a year. The Assistant Director of Sanitary ervice, Nigeria, the Deputy Director of Sanitary Service in he Gold Coast and the Deputy Director of Sanitary Service n Sierra Leone receive salary at the rate of £1300 a year, ith duty allowance at the rate of £260 a year. Specialists: he number of these appointments is not fixed, officers of utstanding professional merit being eligible for appointment. he salary is at the rate of £1300 a year, with duty allowance t the rate of £260 a year. After five years' approved service s such, the specialist officer is eligible to receive a salary at e rate of £1400 a year, with duty allowance at the rate of 280 a year. There are at present four officers appointed pecialists in Nigeria and two in the Gold Coast. Senior ledical Officer: There are twenty appointments of this rade, with salary at the rate of £1000 a year, rising by nnual increments of £50 to £1150 a year, and seniority llowance at the rate of £100 a year. The Senior Medical fficer, Gambia, is allowed "staff pay" of £150 a year, in ddition to duty allowance, but he is debarred from private ractice. Senior Sanitary Officer: There are six appointents of this grade, with salary at the rate of £1050 a year, sing by annual increments of £50 to £1200 a year, and a uty allowance at the rate of £210 a year. Medical Officer: he salary attached to this grade is at the rate of £660 a year, sing by annual increments of £30 to £720 a year. Then, confirmed in the appointment, £720 a year, rising by nnual increments of £40 to £960, with seniority allowance at e rate of £72 a year. Before passing £800, medical officers e required to take a special course of study for three months. they obtain satisfactory certificates at the end of the ourse they draw their further increments up to £960 a year.

A medical officer who has served for three years on e maximum salary of this scale (£960) without btaining promotion is eligible, if recommended by e Governor, to be placed on the scale £1000–£50–1150, with £100 seniority allowance (as for Senior ledical Officers).

Special Appointments.—The director of the Medical esearch Institute, Lagos, and the pathologist, Accra, eceive a salary of £1300 a year, with a duty allowance £260 a year, rising after five years' approved service to a salary at the rate of £1400 a year and duty allowance at the rate of £280 a year. Salary at the rate of £800 a year, rising by annual increments of £40 to £960 a year, is attached to about ten posts (those of assistant at the Medical Research Institute, Lagos, and medical officers of health at various places), irrespective of the seniority of the officer holding the appointment. In addition to the seniority allowance (£72 a year), staff pay at the rate of £150 a year is also attached to these posts; and the holder of the appointment draws half of the staff pay during leave of absence, the remainder being drawn by his locum tenens. The holders of these appointments are not allowed private practice.

Duty allowances, seniority allowance, and staff pay are not pensionable emoluments.

Increments.—Increments to salaries are payable only when the service of an officer during the period of employment qualifying for increment is approved.

Payment of Salaries.—Information as to the payment of officers' salaries or of monthly remittances to persons in England may be obtained from the Crown Agents for the Colonies, 4, Millbank, S.W. 1. All allowances are paid locally.

All officers of the staff, except directors, deputy directors, assistant directors, senior sanitary officers, and a few other officers holding special appointments, are at present allowed to take private practice, provided that it does not interfere with the faithful and efficient performance of their official duties, but it is within the power of the Governor to withdraw or suspend the privilege in such places and for such periods as he may consider desirable. Private practice does not exist at the majority of stations, and no guarantee can be given that an officer will be posted to a station in which he will be able to practise privately. As a general rule, and subject to the exigencies of the service, stations where there is private practice are allocated to senior members of the Staff.

Pensions and Gratuities.—Pensions and gratuities on retirement from the service are granted in accordance with the law and regulations of each individual Colony.

Fuller information can be obtained from the Private Secretary, Colonial Office, Whitehall, London, S.W. 1.

DIPLOMAS IN TROPICAL MEDICINE.

ALTHOUGH a qualification in tropical medicine has not been made registrable by statute, a diploma is regarded as indispensable for appointments in the Colonial Medical Service and similar positions abroad. Systematic instruction for these diplomas is given at the Incorporated Liverpool School of Tropical Medicine (founded in 1898) and at the London School of Tropical Medicine, 5, Endsleigh-gardens, London, N.W. 1 (founded in 1899), which is a school of the University of London in the Faculty of Medicine.

University of Cambridge.—Two Examinations in Tropical Medicine and Hygiene are conducted yearly by the State Medicine Syndicate of the University of Cambridge. The examinations are held in Cambridge early in August and at the end of December. Each examination will extend over four days.

Any person whose name is on the Medical Register is admissible as a candidate to the examination provided (I.) that a period of not less than 12 months has elapsed between his attainment of a registrable qualification and his admission to the examination; (II.) that he produce evidence, satisfactory to the Syndicate, that he has diligently studied Pathology (including parasitology and bacteriology) in relation to Tropical Diseases, Clinical Medicine, and Surgery at a Hospital for Tropical Diseases, and Hygiene and Methods of Sanitation applicable to Tropical Climates. As evidence of study and attainments a candidate may present to the Syndicate (1) any dissertation, memoir, or other record of work carried out by himself on a subject connected with Tropical Medicine or Hygiene; (2) any Certificate or Diploma in Public Health or Sanitary Science he may have obtained from a recognised Examining Body. Such evidence will be considered by the Syndicate in determining whether he is qualified for admission to the examination and by the examiners in determining whether, if admitted, he shall be included in the list of successful candidates.

The examination will be partly in writing, partly oral, and partly practical and clinical (the clinical part will be conducted at a hospital for tropical diseases, at which cases will be submitted for diagnosis and comment), and will have reference to the nature, incidence, prevention, and treatment of the epidemic and other diseases prevalent in tropical countries. Every candidate who passes the examination to the satisfaction of the examiners will receive from the University a diploma (D.T.M. & H.) testifying to his knowledge and skill in tropical medicine and hygiene.

The fee for the examination is £9 9*s.*, and applications should be addressed to Dr. Graham-Smith, Medical Schools, Cambridge.

University of London.—The M.D. degree may be taken in tropical medicine at an examination held twice annually, for which a thesis may be submitted.

University of Liverpool.—The University grants a Diploma in Tropical Medicine. At the end of each full course an examination is held by the University for its Diploma of Tropical Medicine (D.T.M.), which is open only to those who have been through the course of instruction of the school. The subjects of examination are (*a*) Tropical Pathology, Parasitology and Entomology; (*b*) Tropical and Applied Bacteriology; (*c*) Tropical Hygiene and Sanitation; (*d*) Tropical Medicine, including Ætiology, Symptoms, Diagnosis, and Treatment of Tropical Diseases. The advanced course consists entirely of Practical and Clinical Laboratory Work, given at the laboratory at the University. The fee for the full course of instruction is £21, with an extra charge of 10*s.* 6*d.* for the use of a microscope if required. Applications should be made to the Dean of the Medical Faculty, University of Liverpool. Two University Fellowships of £100 a year each are open to students of the school, amongst others. Accommodation for research work is to be had at the University Laboratory. The Mary Kingsley Medal is awarded by the school for distinguished work in connexion with Tropical Medicine.

Conjoint Board R.C.P. Lond., R.C.S. Eng.—The diploma of D.T.M. & H. Eng. is awarded on the results of an examination held thrice yearly in January, April, and July. Candidates must possess a registrable qualification, and produce evidence of having attended (1) practical instruction in pathology, protozoology, helminthology, entomology, bacteriology, and hygiene in relation to tropical medicine in a recognised institution during not less than three months, (2) clinical practice of a recognised hospital for the same period. Conditions of study may be modified in the case of candidates of special experience. Fee for admission to the examination, £9 9*s.*, 14 days' notice of entry to the Secretary, Examination Hall, Queen-square, London, W.C. 1.

DIPLOMA IN OPHTHALMIC MEDICINE.

Special diplomas in ophthalmic medicine and surgery are issued by two examining bodies.

University of Oxford.—The diploma in ophthalmology (D.O.) is granted to registered medical practitioners after passing an examination, held annually in July, which is open to candidates who have pursued at Oxford a course of study in ophthalmology over a period of at least two months and who have attended a 12 months' recognised hospital course.

Conjoint Board R.C.P. Lond., R.C.S. Eng.—The Conjoint Board grants the D.O.M.S. after an examination held in two parts, twice yearly in January and July. Part I. comprises anatomy and embryology of the visual apparatus, physiology of vision, and elementary optics. Part II. comprises optical defects, ophthalmic medicine and surgery, and pathology with special reference to ophthalmology. The examination in each case is written, oral, and practical or clinical. Candidates may only enter for Part II. on completion of a year of special study of ophthalmology after obtaining a registrable qualification. Fee for admission, £6 6*s.*

DIPLOMAS IN PUBLIC HEALTH.

As usual we include in the Students' Number of The Lancet an epitome of the instruction given at various universities and centres of medical education to medical men desiring to obtain diplomas in sanitary science, public health, hygiene or State medicine, as this discipline is variously called. Resolutions, designed with a view of ensuring "the possession of a distinctively high proficiency, scientific and practical, in all the branches of study which concern the public health," have been adopted at various times by the General Medical Council from 1902 to 1911. The new regulations, which come into force on Jan. 1st next, extend the period of study and postpone the granting of a diploma until at least two years from qualification.

Conjoint Board of the R.C.P.Lond. and R.C.S.Eng.—The following are the regulations for obtaining the Diploma in Public Health: The examination consists of two parts. The first part of the examination takes place in January and July, and the second part in January and July. The fee for each part is £10 10*s.*, except for those who are diplomates of the Royal Colleges, who pay £6 6*s.* for each part. A candidate intending to present himself must give 14 days' written notice to the Secretary, at the Examination Hall, Queen-square, London, W.C. 1. He will be admissible to examination in Part I. on producing evidence (1) of having been in possession of a registrable qualification for at least 12 months; and (2) of having attended thereafter practical instruction in a laboratory recognised by the Examining Board in England for at least 240 hours during a period of six months. A candidate will be admitted to Part II. of the examination on producing evidence (1) of having been diligently engaged in acquiring a practical knowledge of Public Health administration during six months, which may be reduced to three months under certain specified conditions; and (2) of having attended during three months the clinical practice of a hospital for infectious diseases.

New regulations requiring a more extended course of special study will come into force on Jan. 1st, 1924, which will apply to all candidates who have not commenced bonâ-fide study of Public Health in accordance with the above regulations before that date. They are as follows: The Examination consists of two Parts. Part I. will be held in the months of January, April, and June, and Part II. in the months of January, April, and July in each year. Candidates may enter for Parts I. and II. separately or at the same time, but they must pass Part I. before proceeding to Part II. The Examination in each part will be written, oral, and practical. Part II. will include a practical examination in Infectious Diseases, Food Inspection, and Inspection of selected Premises. The Fee for admission to each Part of the Examination, which must be paid three days before that part commences, is £10 10*s.*, except in the case of Candidates who possess the Licence, Membership, or Fellowship of the Royal College of Physicians of London, or the Membership or Fellowship of the Royal College of Surgeons of England, who will be required to pay £6 6*s.* only for each part. Candidates who fail to satisfy the Examiners in either part may present themselves again at the next Examination on payment of the same Fees. Candidates intending to present themselves for either part of the Examination must give 14 days' notice in writing to the

Secretary, at the Examination Hall, Queen-square, Bloomsbury, London, W.C. 1.

Candidates will be admissible to Examination in Part I. on producing evidence :—

1. Of being in possession of a registrable qualification in Medicine, Surgery, and Midwifery.

2. Of having attended during [illegible] period of not less than ive months at an Institution recognised by the Examining Board in England, practical instruction in (*a*) Bacteriology and Parasitology (including Medical Entomology) especially n their relation to diseases of man and to those diseases of the lower animals which are transmissible to man, during 180 hours, of which not less than 150 hours have been occupied in practical laboratory work. (*b*) Chemistry and Physics in relation to public health, during 90 hours, of which not less than 70 hours have been occupied in practical aboratory work. (*c*) Meteorology and Climatology in relation to public health, during not less than 10 hours.

Candidates will be admitted to Part II. of the Examination on producing evidence :—

1. Of having been in possession of a registrable qualification in Medicine, Surgery, and Midwifery during not less than two years, of being registered by the General Medical Council, and of having completed the curriculum for the Diploma extending over a period of 12 calendar months subsequent to the attainment of a registrable qualification.

2. Of having attended, after obtaining the registrable Qualification, instruction during not less than 80 hours at an Institution recognised by the Examining Board in England in the following subjects :—(*a*) The Principles of Public Health and Sanitation for not less than 30 hours ; *b*) Epidemiology and Vital Statistics for not less than 20 hours ; (*c*) Sanitary Law and Administration (including Public Medical Services) during not less than 20 hours ; *d*) Sanitary Construction and Planning during not less than 10 hours.

3. Of having attended for three months the clinical practice of a hospital for infectious diseases recognised by the Examining Board in England and of having therein received nstruction in the methods of administration. This course must include 30 daily attendances of not less than two hours n each week.

4. Of having been engaged during a period of not less than six months in acquiring a practical knowledge of the duties, routine and special, of public health administration under the supervision of a Medical Officer of Health, and of having received, from such officer or other competent Medical Officer during not less than three hours on each of 60 working days, practical instruction in those duties and also those relating to : (*a*) Maternity and Child Welfare Service ; (*b*) Health Service for children of school age ; *c*) Venereal Diseases Service ; (*d*) Tuberculosis Service ; *e*) Industrial Hygiene ; (*f*) Inspection and Control of Food, ncluding meat and milk.

The above certificate (4) must be obtained from a Medical Officer of Health who devotes his whole time to public work, or from a Medical Officer of Health of a Sanitary Area having a population of not less than 50,000, or in Ireland the Medical Superintendent Officer of Health of a County or County Borough having a population of not less than 50,000.

University of Oxford.—An examination, conducted partly in writing, partly vivâ voce, and in each subject partly practical, is held in Michaelmas and Trinity Term in the following subjects :—General Hygiene, General Pathology (with special relation to Infectious Diseases), the Laws relating to Public Health, Sanitary Engineering, Vital Statistics. The examination is in two parts, which may be taken together or separately ; but Part I. must be passed either before or at the same examination as Part II. The fee for admission to the examination is £10 for each part. Successful candidates are entitled to receive the Diploma in Public Health.

The First Part of the examination will comprise *a*) written papers of three hours each in (i.) Chemistry and Physics, and (ii.) Pathology and Bacteriology ; *b*) a three hours' practical and vivâ voce examination n Chemistry and Physics ; (*c*) a three hours' practical and vivâ voce examination in Pathology and Bacterioogy.

The Second Part of the Examination will consist of the following parts :—(*a*) Two written papers, each of three hours, dealing with General Hygiene (including Sanitary Engineering, Vital Statistics, and the Laws relating to Public Health) ; (*b*) a practical and vivâ voce examination in General Hygiene ; and (*c*) a three hours' practical and vivâ voce examination in Pathology and Bacteriology.

Candidates in Part I. of the examination will be required to produce certificates (1) of Laboratory Work in Chemistry as applied to Hygiene, and (2) of having had Practical Instruction in Bacteriology, and the Pathology of the Diseases of Animals transmissible to Man.

Candidates in Part II. will produce the following further certificates : (3) of a Practical Knowledge of the Duties, Routine and Special, of Public Health Administration ; and (4) of having attended the practice of a Hospital for Infectious Diseases at which opportunities are afforded for the study of the Methods of Administration.

All the above degrees are now open to Women Students, and particulars of Scholarships, &c., may be obtained from the Principals of the various Ladies' Colleges. The names of candidates for the Diploma in Public Health must be sent to the Assistant Registrar of the University, Clarendon Building, Oxford, to whom applications for any further information should be addressed.

University of Cambridge.—Two examinations in so much of State medicine as is comprised in the functions of medical officers of health are held during the year. The examination is divided into two parts and demands proficiency in all the branches of study which bear upon the duties of medical officers of health. The examinations in both parts will be ora and practical, as well as in writing. Candidates may present themselves for either part separately or for both together at their option ; but the result of the examination in the case of any candidate will not be published until he has satisfied the examiners in both parts. Marks of distinction will be placed against the names of candidates who have specially distinguished themselves in either (1) general principles of hygiene ; (2) bacteriology ; (3) chemistry in Part I. of the examination ; or (4) the second part of the examination, which has reference to State Medicine and to the applications of Pathology and Sanitary Science. Every candidate will be required to pay a fee of £6 6*s*. before admission or readmission to *either part* of the examination, but candidates who have presented themselves before the year 1896 will be readmitted to either part on payment of a fee of £5 5*s*. Candidates must before admission to either part of the examination produce evidence of having satisfied provisions (1), (2), and (3), and before admission to Part II. having satisfied provision (4), above mentioned.

For Part I. of the examination courses of lectures and laboratory instruction are given in the University on Hygiene, Chemistry, &c., and on Bacteriology, and a special course on Protozoal Diseases and on Animal Parasites. For Part II. the Medical Officer of Health for Cambridge gives courses on Practical Sanitary Administration and in the Administrative Methods of the Infectious Diseases Hospital, and the Medical Officer of Health to the Cambridgeshire County Council, on Sanitary Laws, School Hygiene, Epidemiology, Vital Statistics, &c. These courses are open to non-members of the University.

A special Diploma in Hygiene is granted to medical graduates whose qualifications are not registrable in England.

All applications for further information respecting examinations and the courses of study should be addressed to Mr. Purvis, Chemical Laboratory, Pembroke-street, Cambridge.

University of London.—Candidates for the M.D. degree may offer State medicine as a subject in which to graduate. They must send to the Academic Registrar with their forms of entry certificates (i.) of having, subsequently to having obtained a registrable qualification to practise Medicine, attended a course of practical instruction in a laboratory or laboratories, British or foreign, approved by the University, in which chemistry, bacteriology, and the pathology of the diseases of animals transmissible to man are taught ; such course to extend over a period of not less than six months and to consist of at least 240 hours, of which not more than one-half shall be devoted to practical chemistry. (ii.) *Either* of having, subsequently to having obtained a registrable qualification to practise Medicine, during six months (of which at least three months shall be distinct and separate from the above-mentioned period of laboratory instruction) been diligently engaged on not less than 60 working days in acquiring a practical knowledge of the duties, routine and special, of Public Health Administration under the supervision of a person recognised by the University as entitled to grant certificates. *Or* of having held for a period of not less than three years an appointment as Medical Officer of Health of a Sanitary District within the British Dominions, and having a population of not less than 15,000. (iii.) Of having, subsequently to having obtained a registrable qualification to practise Medicine, attended at least twice weekly during a period of not less than three months a practice of a hospital for infectious diseases at which opportunities are afforded for the study of methods of administration. In connexion with this degree the various metropolitan medical schools hold regular classes under teachers of Public Health and Sanitary Science, such instruction being also used to obtain the various diplomas of other Universities and of those Royal Corporations which grant them.

University of Durham.—Candidates for the degree of Bachelor of Hygiene (B.Hy.) must be at least 22 years of age, registered, and a graduate in Medicine of a recognised university. They must spend six months at Newcastle-upon-Tyne studying Comparative Pathology, Practical Bacteriology, Sanitary Chemistry, and Physics, and have to pass an examination in Sanitary Chemistry, Physics, Comparative Pathology, Sanitary Legislation, Vital Statistics, Nosology, Climatology, Meteorology, Distribution of Health and Disease, Sanitary Medicine and Practical Hygiene. The fee for the examination for the degree of B.Hy. is £10 10*s.* and for the degree £6 6*s.* Candidates for the degree of Doctor of Hygiene (D.Hy.) shall be Bachelors of Hygiene of two years' standing, and shall be required to satisfy the Examiners that they have conducted original research in the subject of Public Health. The fee for the examination for the degree of D.Hy. is £20 and for the degree £10. The regulations for examination for the Diploma in Public Health (D.P.H.) are the same as those for the degree of Bachelor of Hygiene, except that the candidate is not required to be a graduate in Medicine of a recognised University and the course of study need not be passed at Newcastle-upon-Tyne. The fee for the examination is £10 10*s.* and for the diploma £3.

Victoria University of Manchester.—An examination in Public Health is held twice yearly. The examination is in two parts and is written, oral, and practical. Candidates may present themselves for Parts I. and II. separately or at the same time provided that no candidate be admitted to Part II. unless he has already passed in Part I. No candidate's name will be published until he has satisfied the examiners in both parts of the examination. The fee for each part is £8 8*s.*, and must be paid on or before July 1st in each year. For any subsequent examination in the same part the fee will be £4 4*s.* Every candidate who has passed both parts of the examination to the satisfaction of the examiners, and who is legally registered, will receive a Diploma in Public Health. The examinations will begin about the middle of March and the middle of July in each year. Holders of the Diploma in Public Health are eligible for examination for the Certificates in School Hygiene and Factory Hygiene after attending the prescribed periods of study and hospital practice.

University of Birmingham.—The University grants a degree of B.Sc. in Public Health and also a Diploma in the same subject on the following conditions: Graduates in Medicine of this University may become candidates for the degree of Bachelor of Science in Public Health by conforming to all the requirements laid down for candidates for the Diploma in Public Health, except that after graduating in Medicine all courses of study must be taken out in the University, and they must, in addition, have attended a three months' course of Geology in the University. The examinations will be held in the months of March and June and will consist of two parts, each part being written, oral, and practical. No candidate will be allowed to pass Part II. until he has passed Part I. Candidates may enter for Parts I. and II. separately or at the same time. The fee for each part of the examination is £6 5*s.* Medical Officers of the Royal Navy who have attended courses in Hygienic Chemistry, Bacteriology, and Public Health at the Naval Medical School, Greenwich, will be admitted to the examinations for the Diploma in Public Health, whether they have previously been students at the Birmingham School or not; and the same applies to officers of the Royal Army Medical Corps who have studied Chemistry and Bacteriology at the Staff College and pursued the further course of study approved by the General Medical Council.

Revised regulations take effect as from Oct. 1st, 1923, for B.Sc. and D.P.H., Birmingham.

University of Liverpool.—The University grants a Degree in Hygiene (M.H.) and a Diploma (D.P.H.), and every facility is afforded for training in Sanitary Science and State Medicine. The curriculum for the Degree extends over a period of two years, the first of which is devoted to laboratory instruction and practical classes (including those for the Diploma); the second being devoted to advanced study and research. The courses may be taken out at any time, and students are allowed to work daily in the laboratories. Composition fee for M.H. and D.P.H., £40 per session.

University of Leeds.—The University grants a Diploma in Public Health, and every facility is afforded for training in Sanitary Science and State Medicine. The examination, which is held twice in each year—namely, in June and December—is in two parts, and is written, oral, and practical. Candidates may present themselves for Part I. (Sections 1 and 2), Part I. (Sections 3, 4, and 5), and II. separately or at the same time, provided that no candidate be allowed to pass in Part II. unless he has already passed in Part I. Fees.—The fee for each part is £6 6*s.*, and for any subsequent examination in the same part £4 4*s.* Instruction in Sanitary Chemistry and Bacteriology is given in the second and third terms. Practical work under arrangement with the Leeds City Council. Prospectus can be obtained from the Dean of the Medical School. The Regulations for this Diploma are at present under review in connexion with the recommendations of the General Medical Council.

University of Bristol.—Diploma in Public Health. Candidates must be at least 23 years of age, shall be fully registered medical practitioners of not less than two years' standing as such, and shall have passed the examination prescribed by regulation. The examination is divided into two parts.

University of Edinburgh.—Two degrees in Science in the Department of Public Health are conferred by the University of Edinburgh—viz., Bachelor of Science in Public Health and Doctor of Science in Public Health. A Diploma in Tropical Medicine and Hygiene is also granted. Candidates for the degree of B.Sc. in Public Health must be graduates in Medicine of a recognised University, and must pass two examinations, for the first of which they must, after graduation in Medicine, have worked for at least 20 hours per week during a period of not less than eight months, of which at least five consecutive months must be in the Public Health Laboratory of the University of Edinburgh and the remainder either there or in a laboratory recognised by that University; they must also have attended courses of instruction

Physics and Geology in some Scottish University. andidates are not admitted to the Second Examination sooner than six months after having passed the irst Examination, nor sooner than 18 months after aving taken their degree in Medicine, and they must ave attended two separate courses in Public Health some University of the United Kingdom or in such edical school or Indian, Colonial, or Foreign University as may be approved for the purpose by Edinburgh niversity, each course consisting of 40 lectures at ast ; one of which courses shall deal with medicine nd the other with engineering, each in its relation o public health. The subjects of examination include aboratory work, Physics, Geology, Medicine in its pplication to Public Health, Sanitation, Sanitary aw, and Vital Statistics. Graduates who have held he degree of B.Sc. in Public Health from the University of Edinburgh for a term of five years may offer hemselves for the degree of D.Sc. in Public Health that University. They must then present a hesis and pass an examination in Public Health. he fees are £4 4*s*. for the First and £5 5*s*. for the econd B.Sc. Examinations, and £15 15*s*. for the egree of D.Sc.

University of Aberdeen.—The Diploma in Public ealth (D.P.H.[1]) is conferred only on graduates in edicine of a University in the United Kingdom not ss than 12 months after medical graduation. Every andidate must produce evidence of having complied ith the following requirements: (1) A course or ourses of instruction consisting of not fewer than) meetings dealing with public health in relation o the administrative and other duties of a medical ficer of health, such course or courses to be given y a teacher or teachers in the department of public ealth of a recognised medical school. (2) Practical struction within a laboratory or laboratories pproved by the University, in (*a*) Bacteriology,) Physics and Chemistry, (*c*) Parasitology, such struction to extend over not less than six months two academic terms. (3) Practical Instruction, linical and Administrative, within (*a*) a hospital for eneral infectious diseases—not less than thrice eekly ; (*b*) a hospital or sanatorium or treatment entre for tuberculosis—not less than once weekly ;) a hospital or treatment centre for venereal diseases -not less than once weekly ; such instruction in each roup to extend over three months. (4) Practical struction and experience during not less than three onths in the duties, routine and special, of public ealth administration, under the personal supervision a medical officer of health or other medical officer, , alternatively, that the candidate has held, within he British Dominions, for a period of not less than hree years, an appointment as medical officer of health a sanitary district with a population of not less than 5,000. (5) Practical instruction in : (*a*) Mother and hild Welfare at a Centre or Centres in a Welfare cheme conducted or approved by a Local or Sanitary uthority—not fewer than ten meetings ; (*b*) School ygiene and Medical Inspection of School-children—ot fewer than six meetings ; (*c*) Drawing and Interpretation of Plans—not fewer than six meetings. he fee for the examination is £4 4*s*. for each part, £8 8*s*. for the whole examination.

University of Dublin (*Trinity College*).—The Diploma Public Health is conferred, after examination, on he following conditions. The candidate must be a egistered medical practitioner and have obtained a egistrable qualification at least two years before he second part of the examination. The candidate ust have completed, subsequently to obtaining a egistrable qualification, five months' practical struction in a chemical and bacteriological laboratory, or laboratories, approved by the University, ust have studied practically outdoor sanitary work or six months under an approved officer of health, nd must have attended for three months at a fever ospital where opportunities are afforded for the study of methods of administration. A special prospectus and a list of recognised laboratories may be obtained by application to the Registrar of the School of Physic, Trinity College, Dublin.

National University of Ireland.—At this University there is a Diploma in Public Health, a B.Sc. in Public Health, and a D.Sc. in Public Health. The Diploma may be granted to matriculated or non-matriculated students of the University who shall have completed approved courses of study and shall have passed the prescribed examinations, provided that it shall not be granted except to a registered medical practitioner. Candidates may present themselves for the examination after an interval of not less than 12 months from the time of obtaining a registrable qualification. The curriculum extends over a period of not less than nine calendar months. Every candidate must produce a certificate that he has attended practical instruction in a laboratory, approved by the University, in Chemistry, Bacteriology, and the Pathology of the diseases of animals transmissible to man. The examination consists of two parts, which may be passed separately or together. Part I. comprises the following subjects: Chemistry, Meteorology and Climatology, and Sanitary Engineering and Architecture. Part II. comprises the following subjects: Bacteriology, Hygiene, Sanitary Law, and Vital Statistics. The examination in each part will be oral and practical as well as written.

For the B.Sc. in Public Health a candidate shall not be admitted unless he (*a*) shall have received the degrees of M.B., B.Ch., and B.A.O. at least one year previously ; (*b*) shall have pursued an approved course of study in the Faculty of Medicine ; and (*c*) shall have passed the prescribed examination. In addition to D.P.H. course the candidate will be required to take up (1) a Special Course of Pathology ; (2) Bacteriology ; and (3) Advanced Course in Hygiene. Each of these courses lasts three months.

University of Belfast.—A Diploma in Public Health is given by examination. Every candidate must produce evidence that, after obtaining a registrable qualification, he has during six months received practical instruction in an approved laboratory in which Chemistry, Bacteriology, and the Pathology of the diseases of animals transmissible to man are taught. After obtaining a registrable qualification every candidate must produce evidence that he has attended during three months the practice of a hospital for infectious diseases at which opportunities are afforded for the study of methods of administration. The examination must have extended over not less than four days, one of which shall have been devoted to practical work in a laboratory, and one to practical examination in, and reporting on, subjects which fall within the special outdoor duties of a medical officer of health. The examination will be held in two parts, in March and in June. The first part of the examination will have reference to the general principles of sanitary science and the second part to State Medicine and to the applications of Pathology and Sanitary Science. The fee for each part is 1 guinea.

Royal College of Physicians of Edinburgh, Royal College of Surgeons of Edinburgh, Royal Faculty of Physicians and Surgeons of Glasgow.—All candidates for the Diploma in Public Health must have a qualification which has been registered under the Medical Acts. Candidates must have attended not less than four calendar months' practical instruction in Chemistry and Bacteriology in a recognised laboratory or laboratories, must have studied outdoor sanitary work for six months under a medical officer of health or other sanitary officer ; and must give evidence of attendance for three months at the practice of a Hospital for Infectious Diseases, at which he has received instruction in the methods of administration. The examination consists of two parts, and candidates may enter for both at one period or for either separately. The First Part includes (*a*) Laboratory Work (Chemistry and Bacteriology), (*b*) Physics and Meteorology; and the Second Examination embraces (*a*) Report on Premises visited, (*b*) Examination at Fever Hospital, (*c*) Examination at Public Abattoir, (*d*) Written and Oral Examinations on Epidemiology and Endemiology, (*e*) Vital Statistics and Sanitary Law, and (*f*) Practical Sanitation. The fee is 12 guineas for both examinations, or 6 guineas for either of them. A fee of 3 guineas is payable by rejected candidates for either examination. The examination is held twice yearly, in May and October. The published regulations provide detailed synopses of the subjects of examination, and intimation is made that the curriculum and examination will be adjusted to meet the requirements of the regulations of the General Medical Council which come into force on Jan. 1st, 1924. Candidates applying for Regulations should state date of commencement of curriculum. The Registrar for Edinburgh is Mr. D. L. Eadie, 49, Lauriston-place, and for Glasgow Mr. Walter Hurst, 242, St. Vincent-street.

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[1] New Regulations for the Diploma in Public Health are at esent under consideration.

Royal College of Physicians of Ireland and Royal College of Surgeons in Ireland.—Every candidate for the Diploma in Public Health must be a registered medical practitioner. He must subsequently to qualification (1) receive four months' laboratory instruction in Chemistry, Bacteriology, and the Diseases of Animals transmissible to man; and (2) during six months practically study outdoor sanitary work under a medical officer of health, and shall as an additional requirement attend a hospital for infectious diseases. Candidates are examined on four days, commencing on the first Monday of February, May, and November. The examination comprises the following subjects: Hygiene, Chemistry, Meteorology and Climatology, Engineering, Vital Statistics, Sanitary Law, and Bacteriology. The fee for the examination is £10 10*s*. For further particulars apply to Alfred Miller, O.B.E., Secretary, Committee of Management; Office, Royal College of Surgeons, Dublin.

The Universities of Sheffield, Wales, and St. Andrews also grant a Diploma in Public Health, and the University of Glasgow confers the B.Sc. and D.Sc. in Public Health.

DIPLOMA IN RADIOLOGY.

IN June, 1919, the University of Cambridge instituted a Diploma in Medical Radiology and Electrology to be taken by medical graduates after a course of study extending over a period of six months or more. The lecture course in Part I. consists of physics and electro-technics with photography; in Part II. of radiology and electrology—in each case with special reference to diagnosis and treatment. Six months' clinical experience is required in the electrical department of a recognised hospital. Lecture courses are arranged twice a year alternately in Cambridge and in London. Apart from examination, a diploma may be granted to a medical practitioner of not less than ten years' standing and five years' experience in radiology on presentation of a dissertation. Application to the Secretary, Dr. Shillington Scales, Medical Schools, Cambridge.

UNIVERSITY OF LONDON.—On August 14th Mr. G. G. Gillam was elected to the Epsom Scholarship tenable in the Faculty of Medical Sciences at University College, London.

FORMALDEHYDE.—The Board of Trade announces that under the Safeguarding of Industries Act, Part I. (Arbitrations under Section 1, Subsection 5), the referee has given his decision in the matter of a complaint under the above subsection that formaldehyde has been improperly included in the lists of articles chargeable with duty under Part I. of the Act. The referee has awarded that formaldehyde be excluded from the lists, and the withdrawal will take place as from August 20th.

DENTAL SURGERY.

ANYONE who is on the Medical Register is entitled to practise as a dentist, although he cannot register as such without degree or licence in dentistry; but it is of eminent advantage to take a special dental qualification, otherwise few dental appointments at general or special hospitals or dispensaries are available.

THE DENTAL BOARD OF THE UNITED KINGDOM.

Under the Dentists Act, 1921, the powers and duties of the General Medical Council under the Dentists Act, 1878, and under the Medical Act, 1886, which related to the keeping of the Dentists Register and the administration of the Dentists Acts were largely transferred to the then newly-constituted Dental Board of the United Kingdom. The registration of dental students at the commencement of their dental studies, and the right of erasure of a name from the Dentists Register, remain with the Council, but the duty of inquiring into disciplinary cases rests with the Board, upon whose recommendations the Council acts.

The Dental Board consists of a chairman and 12 members; the following are their names and sources of appointment: Chairman of the Board: Rt. Hon. F. Dyke Acland, appointed by the Privy Council. Members of the Board: Mr. L. G. Brock, Mr. W. H. Dolamore, M.R.C.S., L.D.S., and Mr. W. H. Gilmour, M.R.C.S., L.D.S., appointed by the Minister of Health; Mr. D. M'Coig Cowan, M.P., and Mr. William Guy, F.R.C.S.E., L.D.S., appointed by the Scottish Board of Health; Mr. James H. Stirling and Mr. Edward L. Sheridan, F.R.C.S.I., L.D.S., appointed by the Lord Lieutenant of Ireland; Mr. H. J. Waring, Sir James Hodsdon, and Sir Arthur Chance, appointed by the General Medical Council; Mr. John Butterfield and Mr. H. A. Robertshaw, appointed by the Privy Council. Treasurers of the Board: Mr. H. J. Waring and Mr. W. H. Dolamore.

The offices of the Board are at 44, Hallam-street, London, W. 1, adjoining the offices of the General Medical Council.

REGISTRATION OF DENTAL STUDENTS.

The following are the General Medical Council's Regulations in regard to the registration of dental students which came into force on Jan. 1st, 1923.

The Council recommends that, subject to such exceptions as the Council may from time to time allow, every dental student at the commencement of his studentship should be registered in the manner and under the conditions hereinafter set forth.

1. The registration of dental students shall be carried on at the General Medical Council Office in London, in the same manner as that of medical students, and is subject to the same regulations as regards age and preliminary examinations; but in the case of dental students professional study may commence by pupilage with a registered dental practitioner.

2. Candidates for a diploma in dental surgery should produce certificates of having been engaged for at least four years in professional studies, and of having received during 24 calendar months instruction in mechanical dentistry (see No. 3 below).

3. It is recommended that instruction in dental mechanics be taken at a recognised dental hospital and school. If any part of such instruction be taken by the candidate as a pupil with a registered dental practitioner, the time required to be devoted to it shall be at least twice the time required for the corresponding instruction taken at a dental school.

4. Two years' bona-fide apprenticeship with a registered dental practitioner, after registration as a dental student, may be counted as one of the four years of professional study.

5. The necessary instruction in dental mechanics, or any part of it, may be taken by the dental student either before or after his registration as a student. When a student can show evidence of regular pupilage in dental mechanics to a registered

practitioner, prior to the passing of the prescribed preliminary and scientific examinations, he may be allowed to antedate his registration for a period not exceeding one year prior to the passing of these examinations (see No. 3 above).

List of Schools of Dentistry at which Dental Study may be Commenced.—Birmingham Dental Hospital. Bristol: Royal Infirmary, General Hospital. Dublin: Dental Hospital of Ireland. Dundee: Dental Hospital. Edinburgh Dental Hospital. Glasgow Dental Hospital. Leeds Dental Hospital. Liverpool Dental Hospital. London: Guy's Hospital Dental School, London Hospital Dental School, National Dental Hospital, Royal Dental Hospital. Manchester Dental Hospital. Newcastle-upon-Tyne Dental Hospital. Sheffield Royal Hospital. The Royal College of Surgeons in Ireland. The Dental department of any University of the United Kingdom.

THE EXAMINING BODIES IN DENTISTRY.

THE ROYAL COLLEGE OF SURGEONS OF ENGLAND grants a diploma in Dental Surgery under the following regulations, which apply to all candidates who have passed the required Preliminary Examination in General Education before Jan. 1st, 1923.

Candidates are required to pass three examinations: the Preliminary Science Examination, the First Professional Examination, and the Second Professional Examination. 1. Preliminary Science Examination.—This is identical with Part I. of the First Examination of the Examining Board in England. Candidates who commenced professional study on or after Oct. 1st, 1913, must pass the Preliminary Science Examination before commencing the courses required for the Second Professional Examination. 2. The First Professional Examination.—The candidate must produce evidence of instruction in Dental Metallurgy and Practical Dental Mechanics. The Examination consists of Part I. (Mechanical Dentistry), Part II. (Dental Metallurgy), the examination in Dental Metallurgy being by written paper, and Part III. (*a*) General Anatomy and Physiology, (*b*) Dental Anatomy and Physiology conducted by papers and vivâ voce examination. The parts may be taken together or separately. 3. The Second Professional Examination.—This is divided into two parts: (*a*) the General, (*b*) the Dental. The General part must be passed before the Dental portion. The instruction is obtained partly at a General Hospital and partly at a Dental Hospital. The Second Professional Examination consists of: Part I., General Surgery and Pathology; Part II., Dental Surgery and Pathology, and Practical Dental Surgery. There is a written and vivâ voce examination in each part and a practical examination as well in Part II. Exemption from the Preliminary Science Examination is granted to candidates who have passed an Examination in Chemistry and Physics for a degree in Medicine at a University in the United Kingdom, in India, or in a British colony. Exemption from Examination in Anatomy and Physiology is granted to candidates who have passed the Second Examination of the Examining Board in England or the corresponding Examination for any degree or qualification in Medicine or Surgery registrable under the Medical Act of 1886. Exemption from Examination in General Surgery and Pathology is granted to candidates who have passed the Examination in Surgery of the Examining Board in England or the corresponding Examinations of the Colleges and University above mentioned. The fee for the diploma is 20 guineas, and is payable as follows: Preliminary Science Examination, for each admission to Part I., £3 3*s.*; Part II., £2 2*s.* First Professional Examination, for each admission to Part I., £4 4*s.*; Part II., £1 1*s.*; Part III. (*a*) £2 2*s.*; (*b*) £2 2*s.*; Second Professional Examination, for each admission to Part I., £2 2*s.*; Part II., £4 4*s.*

The following Regulations will apply to all candidates who pass the Preliminary Examination in General Education on or after Jan. 1st, 1923.

1. Candidates for the Licence in Dental Surgery of the Royal College of Surgeons of England are required to pass one of the Examinations in General Education recognised by the Conjoint Examining Board in England, and the Pre-Medical Examination in Chemistry and Physics conducted by that Board or one of the examinations recognised in lieu thereof, before they commence the curriculum of professional study for the Licence extending over four years.

2. Candidates who produce evidence of having been registered by the General Medical Council as Medical or Dental Students on or after Jan. 1st, 1923, will be considered to have passed the required Preliminary Examination in General Education and the Pre-Medical Examination.

3. Candidates who hold the degree of D.M.D. Harvard, D.D.S. Pennsylvania, D.D.S. Michigan, D.D.S. Illinois, D.D.S. St. Louis, Missouri, D.D.S. Northwestern University, Chicago, D.D.S. Minnesota, or the Licence of the Dental Board of Victoria, Australia, are not required to pass these Examinations.

First Professional Examination.—1. The First Professional Examination consists of Part I. Dental Mechanics, Part II. Dental Metallurgy, and Part III. Section (*a*) General Anatomy and Physiology, Section (*b*) Dental Anatomy and Physiology, and is held in January or February, April, and September or October in each year.

2. Candidates may present themselves for the several Parts of the First Professional Examination together or separately, but before admission to any part of the Examination they must produce evidence of having passed the required Preliminary Examination in General Education and the required Pre-Medical Examination or a certificate of having been registered as a Medical or Dental Student by the General Medical Council.

Part I. *Dental Mechanics.*—3. This Examination is a practical one, conducted in the Mechanical Laboratory of one of the Dental Hospitals in London.

4. Candidates must give 21 days' notice in writing of their intention to present themselves for the Examination, and at the same time forward certificates:—

(1) Of having been engaged during a period of not less than two years in acquiring a practical familiarity with the details of Dental Mechanics. One year at least of this study must be taken in the Mechanical Department of a recognised Dental Hospital where the arrangements for teaching Dental Mechanics are satisfactory to the Board of Examiners in Dental Surgery. Part or the whole of the rest of the course may be taken as a pupil with a competent dentist provided that time spent as a private pupil shall be at least twice the time required for the corresponding instruction[*] taken at a Dental School.

(2) Of having attended at a recognised Dental Hospital and School: (*a*) A course of lectures on Dental Mechanics; (*b*) a course of Practical Dental Mechanics, including the manufacture and adjustment of 6 dentures and 6 crowns.

6. Any candidate referred at this Examination who does not hold a registrable Dental Qualification will be required, before admission to re-examination, to produce a certificate of having received three months further instruction under the conditions specified in Certificate (1) paragraph 4.

Part II. *Dental Metallurgy.*—7. This Examination is conducted by written paper.

8. Candidates must give 21 days' notice in writing of their intention to present themselves for the Examination, and at the same time forward a certificate:—Of having attended at a recognised Dental Hospital and School: (*a*) A course of lectures on Dental Metallurgy; (*b*) a course of Practical Dental Metallurgy.

9. Any candidate referred at this Examination who does not hold a registrable Dental Qualification will be required, before admission to re-examination, to produce a certificate of having received, subsequently to the date of reference, not less than three months' instruction in Dental Metallurgy in a recognised Dental School.

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[*] This instruction may be taken prior to the date of passing the Examination in General Education and the Pre-Medical Examination, but will not be counted as part of the required four years of professional study unless taken after passing the Pre-Medical Examination.

Part III. (*a*) *General Anatomy and Physiology*, (*b*) *Dental Anatomy and Physiology*.—10. This Examination is partly written and partly oral.

11. Candidates may enter for Section (*a*) only or for Sections (*a*) and (*b*) together on producing the required certificates, but they will not be allowed to proceed with Section (*b*) until they have passed in Section (*a*). In the case of a candidate who enters for both Sections and fails in Section (*a*) the fee paid for admission to Section (*b*) will not be forfeited, but will be credited to the candidate on readmission to examination in that Section. Candidates who enter for both Sections together may pass in Section (*a*) although failing to pass in Section (*b*).

12. Candidates must give 21 days' notice in writing of their intention to present themselves for the whole or for one Section of this examination and at the same time forward certificates :—

(1) For Part III. (*a*). Of having attended at a recognised Medical School : (*a*) Courses of instruction in Anatomy, including special demonstrations on prepared dissections during three terms ; (*b*) a course of dissections to include, if possible, the head and neck, during one term ; (*c*) courses of instruction in Physiology including General Biology, Biochemistry, and Biophysics, during three terms ; (*d*) a course of instruction in Histology.

(2) For Part III. (*b*). Of having attended at a recognised Dental School : (*a*) A course of instruction in Dental Anatomy and Physiology ; (*b*) a separate course of instruction in Dental Histology, including the preparation of Microscopical Sections.

13. A candidate referred at this examination who does not hold a registrable Dental Qualification will be required, before readmission to Section (*a*), to produce a certificate of three months' additional study of Anatomy and Physiology at a recognised Medical School, and will be required before readmission to Section (*b*) to produce a certificate of three months' additional study of Dental Anatomy and Physiology at a recognised Dental School.

14. *Exemptions*.—Candidates who have passed Section I. of the First Professional Examination of the Conjoint Examining Board in England, or who produce evidence of having passed the Examination in Anatomy and Physiology for a degree, or other qualification, in Medicine or Surgery, registrable under the Medical Act of 1886, or for the degree of M.B. or M.D. of a Foreign or Colonial University recognised by the Conjoint Examining Board in England, are not required to pass Section (*a*).

Second Professional Examination.—1. The Second Professional Examination is held in February, May or June, and November in each year, and consists of : Part I., General Surgery and Pathology ; Part II., Dental Surgery and Pathology, and Practical Dental Surgery.

2. Candidates who have passed the First Professional Examination at least six months[†] previously may present themselves for Part I. only on producing the certificates mentioned in paragraph 6 of this section, or they may enter for the whole Examination at one time on producing the certificates mentioned in paragraphs 6 and 10 of this section.

3. Candidates must pass in Part I. before proceeding to Part II.

4. Candidates who enter for the whole Examination at one time may pass in Part I. although failing to pass in Part II. ; but if they fail to pass in Part I. they will not be allowed to proceed with the Practical and Oral Examinations in Part II. In such cases the fee paid for admission to Part II. will not be forfeited, but will be held over until such time as the candidate is readmitted to examination in that Part.

Part I. *General Surgery and Pathology*.—5. This Examination is partly written and partly oral.

6. Candidates must give 21 days' notice in writing of their intention to present themselves for this Examination, and at the same time forward certificates :—

(1) Of having attended at a recognised Medical School : (*a*) A course of instruction[‡] in Surgery during two terms ; (*b*) a course of instruction in Medicine during two terms ; (*c*) a course of instruction in General Pathology (including Bacteriology) during two terms. (2) Of having acted as Surgical Dresser in the Out-patient Department of a recognised Hospital for three months. (3) Of having attended at a recognised Hospital or Hospitals, the practice of Medicine and Surgery, including clinical lectures, for 12 months. (4) Of being 21 years of age.

7. Any candidate referred at this Examination who does not hold a registrable Dental Qualification will be required, before admission to re-examination, to produce a certificate of such additional study during three months at a recognised Medical School and Hospital as the Teachers of the School may determine.

Exemptions.—8. Candidates who are Members of the College or who have passed the Examination in Surgery of the Conjoint Examining Board in England, or who produce evidence of having passed the Examination in Surgery for a Degree, or other Qualification in Medicine or Surgery registrable under the Medical Act of 1886, are not required to pass Part I. of the Second Professional Examination.

Part II. *Dental Surgery and Pathology*.—This Examination is partly written, partly oral, and partly practical. The oral examination is conducted by the use of preparations, casts, drawings, &c. At the practical examination candidates may be examined :—

(*a*) On the treatment of Dental Caries, on the preparation and treatment of teeth by filling with gold or other material, by inlaying or by crowning, and on other operations in Dental Surgery. (Candidates must provide their own instruments.) (*b*) On the treatment of abnormalities of position of the teeth of children. (*c*) On Clinical cases.

10. Candidates must give 21 days' notice in writing of their intention to present themselves for this Examination, and at the same time forward certificates :—

(1) Of having been engaged during four years in the acquirement of professional knowledge subsequently to the date of registration as a Medical or Dental Student, or of having passed the Pre-Medical Examination conducted or recognised by the Conjoint Examining Board in England. (2) Of having attended at a recognised Dental Hospital and School : (*a*) A course of Dental Surgery and Pathology ; (*b*) a separate course of Practical Dental Surgery ; (*c*) a course of Dental Bacteriology ; (*d*) a course of Dental Materia Medica ; (*e*) a course of practical instruction in the administration of such Anæsthetics as are in common use in Dental Surgery. (3) Of having attended at a recognised Dental Hospital and School, or in the Dental Department of recognised General Hospital, the practice of Dental Surgery during two years.

11. Any candidate referred at this Examination who does not hold a registrable Dental Qualification will be required before admission to re-examination to produce a certificate of three months' additional study at a recognised Dental Hospital.

Fees.—The fee for the Diploma in Dental Surgery is 20 Guineas.

Synopses of examinations and all further information can be obtained from the Secretary, Examination Hall, Queen-square, London, W.C. 1.

Royal College of Surgeons, Edinburgh.—Regulations giving a list of Preliminary Examinations recognised for obtaining the Licence in Dental Surgery, as well as of the subjects of the Professional Examinations, may be obtained from Mr. D. L. Eadie, Clerk to the Royal College of Surgeons, at 49, Lauriston-place, Edinburgh. Candidates must produce certificates of having, subsequently to the date of registration, been engaged for four years in professional studies and of three years' instruction in Mechanical Dentistry from a registered dental practitioner, except in the case of previously registered medical practitioners, when two years will be considered sufficient. Candidates must also have attended a course of instruction at a University or in an established school of medicine or in a provincial school specially recognised by the College as qualifying for the Diploma in Surgery. In addition they will be required to have attended in a recognised dental hospital, or with teachers recognised by the College, special courses of lectures and instruction in Anatomy and Physiology (Human and Comparative), Surgery, Pathology, Materia Medica, Dental Histology, and Practical Dental

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[†] The interval of six months is not required in the case of a colonial or foreign dentist.

[‡] These courses of instruction must be attended after the completion of the courses in Anatomy and Physiology.

Mechanics and Metallurgy; two years' attendance at a dental hospital or the dental department of a general hospital recognised by the College. Practical instruction in Mechanical Dentistry from a registered Dentist, or in the Mechanical Department of a recognised Dental Hospital and School, for three years. Candidates who have passed the First and Second Examinations for the Triple Qualification will be exempt from the First Dental Examination, and will have the advantage of being admissible either to the Final Dental Examination or to the subsequent Examination for the Triple Qualification, or to both. But the First Dental Examination will not be held as equivalent to the First and Second Triple Examinations, and will admit to the Final Dental Examination only. Candidates who are Licentiates of this College or who may be registered medical practitioners will be required to produce certificates of attendance on the special subjects only and will be examined in these only for the dental diploma. First Professional Examination: The candidate must have attended the required courses. The examination embraces (1) Chemistry and Physics; and (2) Anatomy and Physiology. The fee is £5 5*s.* for the complete examination, and £3 3*s.* is payable for each division. In all cases of rejected candidates the fee for re-entry is £3 3*s.* Second Examination: The candidate must have attended the remaining courses of the curriculum, must produce certificates showing that he is 21 years of age, and must pay a fee of £10 10*s.*, for re-entry £5 5*s.* The examination embraces (1) Surgery and Medicine; and (2) the special subjects of Dental Anatomy and Physiology, Dental Surgery and Pathology, Dental Materia Medica, Dental Mechanics and Dental Metallurgy, with a practical as well as the written and oral examinations in the subjects of Dental and Oral Surgery, Pathology, and Mechanics. The candidate will be tested in the Treatment of Dental Diseases, in Operative Dentistry, the Administration of Anæsthetics, Orthodontics, and in Prosthetic and Mechanical Dentistry. Candidates who claim exemption from the First Dental Examination on the ground of having passed the First and Second Triple Qualification Examinations or other recognised examinations will, before being admitted to the Second Dental Examination, be required to pay the total fee of £15 15*s.* payable for the dental diploma. Candidates applying for copies of Regulations should state date of registration as a dental student. Fees and schedules must be lodged with the Clerk not later than one week before the examination.

Higher Dental Diploma.—The College grants a Higher Dental Diploma which is registrable in the Dentists Register as an additional qualification. Every candidate for the Higher Dental Diploma shall produce evidence that he has been engaged in the study or practice of his profession as a Registered Dentist for at least one year subsequent to his having obtained the Licence in Dental Surgery of the College, or a Licence or Qualification in Dental Surgery specially recognised by the College. Particulars as to the examinations can be obtained from Mr. D. L. Eadie, Clerk to the Royal College of Surgeons, 49, Lauriston-place, Edinburgh. The fee payable by Licentiates of the College is £15 15*s.* For all other candidates £21. A fee of £10 10*s.* is retained for examination expenses in the case of referred candidates.

The examination embraces the following branches of Dental Science and practice: Dental Surgery, Anatomy, Pathology and Bacteriology, Prosthesis, Anæsthesia, and Dental Radiology. The examination will be clinical and practical as well as written and oral. Candidates will be expected to show a high degree of knowledge and skill.

ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW.—The regulations as to certificates, curriculum, number, and subjects of examinations, fees, &c., are in effect similar to those of the Royal College of Surgeons of Edinburgh, but embrace Dental Bacteriology. Candidates can enter for the First Examination in three divisions, the first embracing Physics and Chemistry, the second Dental Metallurgy and Dental Mechanics, and the third Anatomy and Physiology. The examination in Dental Mechanics is practical; and there is at the Final Examination an examination in Practical Dentistry conducted in a dental hospital. Copies of regulations, &c., to be obtained from Mr. Walter Hurst, Registrar, Faculty Hall, 242, St. Vincent-street, Glasgow.

ROYAL COLLEGE OF SURGEONS IN IRELAND.—Candidates for the Licence in Dental Surgery, aged at least 21, pass two professional examinations. Before the First Examination the candidate must produce evidence of having attended courses in Theoretical and Practical Chemistry, including Metallurgy and Physics, at a recognised institution; of having been registered as a medical or dental student by the General Medical Council; and of having attended courses of instruction in the following subjects at a recognised school of medicine: (*a*) Anatomy Lectures; (*b*) Dissections with Demonstrations; (*c*) Physiology, including Dental Physiology; (*d*) Practical Physiology and Histology, including Dental Physiology and Histology, Human and Comparative. Before the Final Dental Examination the candidate must have been engaged during a period of two years in acquiring a practical familiarity with the details of Mechanical Dentistry under the instruction of a registered dentist, or under the direction of the superintendent of the Mechanical Department of a recognised Dental Hospital, and have attended, at institutions recognised by the College for the purpose, the following courses of instruction: (*a*) Dental Surgery and Pathology, Orthodontia, and the Materia Medica and Therapeutics applicable to Dental Surgery. Lectures. Two courses. (*b*) Dental Mechanics. Lectures. Two courses. (*c*) Dental Anatomy. Lectures. One course. (*d*) The practice of a Dental Hospital, or of the Dental Department of a General Hospital. Two years. He must also have attended Clinical instructions at a recognised General Hospital during the ordinary teaching sessions (nine months), and have been engaged during four years in the acquirement of professional knowledge subsequently to the date of registration as a medical or dental student. One year's bona-fide apprenticeship with a registered dental practitioner, after being registered as a medical or dental student, may be counted as one of the four years of professional study. In the First Dental Examination candidates will be examined in (A) Physics and Chemistry, including Practical Chemistry and Metallurgy. (B) Anatomy, Physiology, and Histology—General and Dental. All the subjects may be passed at the same time, or they may be passed in two groups (A and B).

In the Final Dental Examination candidates will be examined in General Pathology, Medicine, and Surgery; Dental Surgery, and Dental Pathology, with the Materia Medica and Therapeutics applicable to Dental Surgery; Dental Mechanics and Metallurgy; Orthodontia. Candidates must pass in all the subjects at one examination. The total fee for the Diploma in Dental Surgery is 20 guineas.

UNIVERSITY OF BIRMINGHAM.—The teaching of Dentistry is undertaken by the University acting in association with the Birmingham Dental Hospital and the Birmingham Clinical Board. The instruction at the Dental Hospital is carried out under the direction of the University Dental Clinical Board, so that students may fully qualify themselves for the Dental Diploma (L.D.S.) of this and other universities and licensing bodies. There is a special and well-equipped Dental Museum: The "John Humphreys Odontological Museum." An Entrance Exhibition, value £37 10*s.*, is awarded annually at the commencement of the winter session. The following are the regulations for Degrees in Dentistry:—

1. The degrees conferred by the University are those of Bachelor and Master of Dental Surgery (B.D.S. and M.D.S.). 2. All candidates for these degrees must pass the same Matriculation Examination as that required from candidates for Medical Degrees.

3. The degree of Bachelor of Dental Surgery is not conferred upon any candidate who has not obtained a Licence in Dental Surgery. The candidate is not eligible for the degree until a period of 12 months has elapsed from the passing of his examination for the Licence in Dental Surgery. Of this period at least six months must be spent in the dental department of a general hospital approved by the University. 4. *A*. In addition to the Licence in Dental Surgery the candidate must produce evidence that he has attended the courses required by medical students of the University in the following subjects and passed the Examinations held in the same for Medical and Surgical Degrees: (*a*) Elementary Biology and Organic Chemistry, (*b*) Anatomy and Practical Anatomy, and (*c*) Physiology and Practical Physiology. *B*. That he has passed the class examinations in: (*d*) One Special Course of Lectures on Medicine, (*e*) One Special Course of Lectures on Surgery, and (*f*) Pathology and Bacteriology. *C*. That he has attended courses and passed the class examinations in: (*g*) Dental Histology and Patho-Histology, (*h*) Comparative Dental Anatomy, and (*k*) Dental Surgery and Prosthetic Dentistry. *D*. That he has received instruction in the Clinical Examination of living cases at the dental department of a general hospital for a period of not less than six months. 5. The Final Examination will deal with the subjects in Classes *C* and *D*. 6. On the expiration of 12 months from the date of passing the Examination for the Degree of Bachelor of Dental Surgery, the candidate will be eligible for that of Master of Dental Surgery. 7. For this degree candidates will be required to submit a thesis containing original work, and investigations in some subject connected with Dentistry, which theses shall be submitted to examiners to be nominated by the Dental Advisory Board.

UNIVERSITY OF BRISTOL.—Candidates for the degree of Bachelor of Dental Surgery must be not less than 21 years of age and shall have pursued the courses prescribed by University regulations during not less than five years, of which three shall have been passed in the University, and shall have been registered as dental students by the General Medical Council. All candidates for the degree of B.D.S. are required to satisfy the examiners in the several subjects of four examinations. The First Examination: The subjects are Chemistry, Physics, and Biology, and the curriculum extends over one year.[*] The Third Examination: The subjects are Dental Mechanics, Dental Metallurgy, and Dental Materia Medica, and the candidate shall produce evidence of having served for three years an approved pupilage in Dental Mechanics. The Second Examination: The subjects are Anatomy, Physiology, and Histology, Dental Anatomy, and Dental Histology. The Final Examination: The subjects are Medicine and Surgery, Dental Surgery (including Prosthetics), Operative Dental Surgery, and Dental Bacteriology. Degree of Master of Dental Surgery: Candidates shall be Bachelors of the University, shall present a Dissertation on some subject of Dental Surgery to be approved by the Examiners, and pass an examination in Dental Surgery. Diploma in Dental Surgery: Candidates need not be undergraduates, but shall have passed an entrance examination satisfactory to the University before being admitted to any professional examination; the curriculum extends over four years from the date of passing a preliminary science examination in Chemistry and Physics. A three years' pupilage in Mechanical Dentistry is required[†] and four examinations must be passed, the subjects of which agree with those of the B.D.S. Medicine is not required for the Final Examination. Candidates who are already registered medical practitioners shall be further exempted from study and examination in Physics and Chemistry, Anatomy, Physiology and Histology, Medicine, and General Surgery.

UNIVERSITY OF DURHAM.—Every Dental student must, at the commencement of his studentship, be registered in the manner and under the conditions prescribed for Medical students.

First Examination: This examination consists of two parts, which may be passed separately. Part 1, Biology, Organic Chemistry. Part 2, Theoretical Dental Mechanics, Dental Metallurgy (theoretical and practical). Second Examination: Anatomy, Physiology (including biochemistry and biophysics), Dental Anatomy and Dental Histology. Third Examination: Pathology and Bacteriology, Practical Dental Mechanics, Dental Materia Medica and Therapeutics. Final Examination: Medicine, Surgery, Dental Surgery and Pathology, Orthodontia, Operative Dental Surgery, and Dental Prosthetics.

A candidate before presenting himself for examination is required to furnish certificates of instruction in the following subjects, attended after registration as a dental student at recognised Colleges or Schools: (*a*) Organic Chemistry; (*b*) Elementary Biology[*]; (*c*) Human Anatomy, with dissections and demonstrations for three academic terms; (*d*) Physiology, including Biochemistry and Biophysics (with laboratory instruction, including practical Histology) for three academic terms; (*e*) General Pathology (including Bacteriology) for two academic terms; (*f*) Medicine for two academic terms; (*g*) Surgery for two academic terms; (*h*) the practice of a recognised General Hospital or Hospitals of not less than 80 beds, with certified instruction in Clinical Medicine and Clinical Surgery, for four academic terms. The certificates of teaching at General Hospitals must furnish evidence of the student having acted as Medical Clinical Clerk and Surgical Dresser, and of attendance in the Out-patient or Casualty Departments. A certificate of clinical instruction in Venereal Disease is required.

The candidate must have attended at a recognised Dental School courses of instruction in the following special subjects: (*a*) Dental Anatomy and Physiology, human and comparative. The course should comprise a minimum of 20 meetings of the class. (*b*) Practical Dental Histology and Morbid Histology. The course should comprise a minimum of 16 meetings of the class. (*c*) Dental Pathology and Surgery. The course should comprise a minimum of 20 meetings of the class. (*d*) Dental Materia Medica and Therapeutics. The course should comprise a minimum of 16 meetings of the class. (*e*) Dental Metallurgy (with practical work and demonstrations). The course should comprise a minimum of 20 meetings of the class. (*f*) Dental Mechanics (with practical work and demonstrations). The course should comprise a minimum of 20 meetings and 20 demonstrations. (*g*) A course of instruction in the use of Anæsthetics, general and local, employed in Dental Practice. (*h*) A course of instruction in Radiology as applied to Dentistry.

Note.—A candidate must produce a certificate of having administered general anæsthetics on at least ten occasions.

The candidate must have for at least 24 calendar months attended, during the ordinary academic terms, the practice of a recognised Dental Hospital or of the recognised Dental Department of a General Hospital, and have received for not less than 24 calendar months practical instruction in Dental Mechanics.

Note.—No portion of such practical instruction which is taken prior to the date of registration shall be reckoned as a portion of the four years of Professional Study required.

Instruction in Dental Mechanics should, if possible, be taken at a recognised Dental Hospital and School. If any part of such instruction be taken by the candidate as a pupil with a registered dentist the time required to be devoted to it shall be at least twice the time required for the corresponding instruction taken at a Dental Hospital and School.

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[*] Candidates who have passed the Higher School Certificate approved by the Board of Education in these subjects will not be required to sit for the first examination for either the B.D.S. or the L.D.S., and will be regarded as having completed one year of study.

[†] This pupilage must be taken either in the University laboratories or those of some institution recognised for the purpose by the University.

[*] A student who has diligently attended an approved course of Elementary Biology in a secondary school or other teaching institution recognised by the University may be admitted to a Professional Examination in Elementary Biology immediately after his registration as a dental student.

The examinations will be held concurrently with the medical examinations, and the fees payable by candidates are as follows: First Examination, £2 10*s.*; Second Examination, £2 10*s.*; Third Examination, £3 10*s.*; Final Examination, £3 10*s.*; fee for Licence, £3; total, £15. For re-examination: First Examination, £1 10*s.*; Second Examination, £2; Third Examination, £2 (in one part only, £1); Fourth Examination, £2. The practical examinations in dentistry will be conducted at the Newcastle Dental Hospital.

University of Leeds.—The degrees in Dental Surgery are Bachelor of Dental Surgery (B.Ch.D.) and Master of Dental Surgery (M.Ch.D.). All candidates for the degree of Bachelor of Dental Surgery shall be required to have passed the Matriculation Examination, to have pursued thereafter approved courses of study for not less than five academic years, two of such years at least having been passed in the University subsequently to the date of passing Parts I. and II. of the First Examination, and to have completed such period of pupilage or hospital attendance, or both, as may be prescribed by the regulations of the University. No candidate will be admitted to the degree who has not attained the age of 21 years on the day of graduation. The classes in the Department of Dentistry begin on Oct. 1st. The instruction in the Preliminary subjects of Chemistry, Physics, and Biology are given at the University in College-road. The classes in the other subjects and the systematic courses in Dental subjects are held in the School of Medicine of the University in Thoresby-place. The clinical instruction is given in the Dental Department at the Leeds General Infirmary. Applications for the prospectus should be made to the Dean of the Faculty of Medicine.

University of Liverpool.—The University grants a Licence in Dental Surgery (L.D.S.) and degrees in Dental Surgery (B.D.S. and M.D.S.). The management of the curriculum (lectures, practical and clinical) is in the hands of the University Board of Dental Studies. The courses of systematic instruction are given in the main University buildings, and those in Dental Mechanics, Operative Dental Surgery, &c., are given in the University School Extension (opened 1922), adjoining the Dental Hospital, the laboratory of which is in charge of a skilled dental mechanic under the supervision of the Director of Dental Education. The clinical instruction is given in the Dental Hospital. Students can take the whole curriculum including Dental Mechanics, at the University School of Dental Surgery. The times of the lectures at the University are arranged to meet the convenience of students, thus allowing the maximum time for attendance upon Dental Hospital practice. Fees: The fees for the complete courses, including Pupilage and Hospital Practice, are as follows: Degree of B.D.S., £237 10*s.*; M.D.S., £20; L.D.S. (Liverpool), £199; L.D.S. (other licensing bodies), £203. Further information may be had from the Director of Dental Education, Prof. W. H. Gilmour.

In order to be admitted to the Bachelor's Degree in Dental Surgery a student must normally, after registration as an Internal Student, have—(1) Attended prescribed courses of study for five years at one or more Schools of the University. (2) Passed the following examinations: (*a*) First Examination (Part I., Chemistry, Physics; Part II., Zoology); Second Examination (Part I., Dental Metallurgy; Part II., Dental Mechanics); Third Examination (Part (*a*) Physiology and Histology, and Dental Anatomy and Dental Histology, Part (*b*) Anatomy and Dental Materia Medica and Therapeutics); Final Examination (Medicine, Surgery, Dental Surgery, Clinical Dental Surgery and Prosthetic Dental Surgery, Dental Pathology and Dental Bacteriology). Students who have received not less than two years' instruction in Dental Mechanics previous to Nov. 30th, 1922, with a Dentist registered under the provisions of the Dentists Act (1921) and who have passed a recognised examination in Preliminary education may, on application, be registered as students for the Licence under certain conditions.

University of London.—The curriculum for the degree of Bachelor of Dental Surgery covers five years from Matriculation. The Regulations for Internal and External Students may be obtained post-free on application to the Principal Officer, at the University.

University of Manchester.—In the University of Manchester the Dental Department forms an integral part of the Faculty of Medicine. This contains a series of laboratories, lecture rooms, and museums which will bear comparison with those of any other school in the kingdom, and the fullest opportunities for study are offered to students preparing for any of the professional examinations. Instruction adapted to the requirements of students preparing for the B.D.S. Degree and the Dental Diplomas of the University, the Royal College of Surgeons of England, and of other licensing bodies is given throughout the session both at the University and at the Dental Hospital of Manchester adjoining the University. The required general hospital practice is taken at the Manchester Royal Infirmary. Women students are admitted to the classes in the Dental Department, and for them common rooms are provided. The composition fee for candidates for the University degree of Bachelor of Dental Surgery is 93 guineas, payable in three equal yearly instalments. The composition fee for candidates for the University Diploma in Dentistry is 83 guineas, payable in three equal yearly instalments. The composition fee for candidates for the L.D.S. of England is 93 guineas, payable in three equal yearly instalments. Students who have already served their apprenticeship with a private practitioner, and who propose to complete the final portion of their attendance at the University and at an approved dental hospital, will be required to pay the composition fee in two equal instalments at the commencement of the first and second years of studentship. The composition fee does not include the hospital fees, the examination fees, nor the fee for the conferment of the degree or the diploma.

University of Sheffield: *Degree of Bachelor of Dental Surgery.*—A candidate must have attained the age of 22 years on the day of graduation and have pursued the courses of study required by the University regulations during a period of not less than five and a half years subsequent to matriculation and the passing of the further examination in Chemistry and Physics, three of such years at least having been passed in the University, one at least being subsequent to the passing of the First Examination.

First Examination: The subject of the examination is Biology. Candidates must have attended a course of instruction for one year after matriculation and the passing of the further examination in Chemistry and Physics. Second Examination: The subjects of the examination are Anatomy, Physiology, Dental Anatomy, Physiology and Histology; Dental Mechanics, Dental Metallurgy. Final Examination: The subjects of the examination are Part I., General Pathology and Bacteriology, Dental Pathology and Bacteriology; Part II., Medicine and Surgery, Dental Surgery, including Materia Medica and Therapeutics. Candidates for Part II. must have completed five and a half years of professional study.

Degree of Master of Dental Surgery.—Candidates must have passed the examination for the degree of B.D.S. at least one year previously and before admission to the examination must have held for not less than six months a dental appointment in a hospital affording full opportunity for the study of Dental Surgery. Candidates shall not be required to but may present a thesis embodying observations in some subject approved by the Faculty and a candidate whose thesis is of exceptional merit may be exempted from any part of the examination.

Diploma of Licentiate in Dental Surgery.—A candidate must have attained the age of 21 years on the day upon which he is to receive the diploma, and have pursued the courses of study required by the University regulations during a period of not less than four years subsequently to matriculation and the passing of the further examination in Chemistry and Physics. Two years must be passed in the University, one at least being subsequent to the passing of the First Examination.

First Examination: The subject of the examination is Biology. Candidates must have attended a course of instruction for one year. Second Examination: The subjects of the examination are Anatomy and Physiology, Dental Anatomy and Physiology, Dental Mechanics, Dental Metallurgy. Final Examination: The subjects of the examination are: Part I., General Pathology and Bacteriology; Dental Pathology and Bacteriology; Part II., Medicine and Surgery, Dental Surgery, including Materia Medica and Therapeutics. Candidates for Part II. must have completed the fourth year of professional study.

The Dental Composition Fee is £25 for each year of the course. In addition a fee of £50 is payable each year the student receives instruction in Mechanical Dentistry in the Dental Department.

National University of Ireland.—At this University there is a Diploma in Public Health, a B.Sc. in Public Health, and a D.Sc. in Public Health. The Diploma may be granted to matriculated or non-matriculated students of the University who shall have completed approved courses of study and shall have passed the prescribed examinations, provided that it shall not be granted except to a registered medical practitioner. Candidates may present themselves for the examination after an interval of not less than 12 months from the time of obtaining a registrable qualification. The curriculum extends over a period of not less than nine calendar months. Every candidate must produce a certificate that he has attended practical instruction in a laboratory, approved by the University, in Chemistry, Bacteriology, and the Pathology of the diseases of animals transmissible to man. The examination consists of two parts, which may be passed separately or together. Part I. comprises the following subjects: Chemistry, Meteorology and Climatology, and Sanitary Engineering and Architecture. Part II. comprises the following subjects: Bacteriology, Hygiene, Sanitary Law, and Vital Statistics. The examination in each part will be oral and practical as well as written.

For the B.Sc. in Public Health a candidate shall not be admitted unless he (*a*) shall have received the degrees of M.B., B.Ch., and B.A.O. at least one year previously; (*b*) shall have pursued an approved course of study in the Faculty of Medicine; and (*c*) shall have passed the prescribed examination. In addition to D.P.H. course the candidate will be required to take up (1) a Special Course of Pathology; (2) Bacteriology; and (3) Advanced Course in Hygiene. Each of these courses lasts three months.

Queen's University of Belfast.—At the beginning of session 1920–21 a Department of Dentistry was opened, and the following degrees and diplomas are now conferred: Licentiate in Dental Surgery, Bachelor of Dental Surgery, and Master of Dental Surgery. Lecturers have been appointed in Dental Surgery, Dental Mechanics, Dental Metallurgy and Materia Medica, and Orthodontia.

Teaching Institutions in Dentistry.

In addition to facilities provided by the above Universities a number of other dental courses are available. In London, at the Royal Dental Hospital (School of Dental Surgery), Leicester-square, at University College Hospital Dental School, and at the dental departments of Guy's Hospital and of the London Hospital. In the Provinces, at the Birmingham, Manchester, and Newcastle-upon-Tyne Dental Hospitals. In Scotland, at the Incorporated Edinburgh Dental Hospital, the Incorporated Glasgow Dental Hospital, and the dental department of Glasgow Royal Infirmary. In Ireland, at the Incorporated Dental Hospital of Ireland, Dublin.

Medical News.

Westminster Hospital.—The annual old students' dinner will be held on Thursday, Oct. 4th, at the Empire Rooms, Trocadero Restaurant, Piccadilly, Mr. W. G. Spencer in the chair. The hon. secretary is Dr. Adolphe Abrahams, 17, Harley-street, W. 1.

Small-pox in England and Wales.—The number of cases reported during the week ending August 11th was 28. Of these, 20 were from Gloucestershire, 4 from Notts, 3 from Yorks (West Riding), and 1 from Derbyshire.

Lancashire and the Spahlinger Treatment.—In view of the refusal of the Health Ministry to allow part of the accumulated funds of approved societies to be used in obtaining this treatment for insured persons, it has been decided that a party of representatives of some societies pay a visit to Switzerland in September to make investigations on the spot.

Sleep in Churches.—The Bishop of Durham, writing in his *Diocesan Gazette*, appeals for more ventilation in churches, and states that in his opinion the ventilation of parish churches tells more directly on the efficiency of the ministrations of the clergy than many other circumstances apparently more relevant, whilst inattention and restlessness on the part of the congregations result from the breathing of a thoroughly vitiated atmosphere.

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith, W.

Monday, August 27th.—10 a.m., Mr. Maingot: Surgical Pathology. 12 noon: Mr. Simmonds: Applied Anatomy. 2 p.m., Mr. Addison: Surgical Wards.

Tuesday.—12 noon, Dr. Burrell: Chest Cases. 2 p.m., Mr. Sinclair: Surgical Out-patients. 2.30 p.m., Dr. Pritchard: Medical Wards.

Wednesday.—12 noon, Mr. Sinclair: Abdominal Surgery. 2 p.m., Mr. Gibb: Eye Dept. 3 p.m., Dr. Pernet: Skin Dept.

Thursday.—12 noon, Mr. Simmonds: Demonstration of Fractures. 2 p.m., Mr. MacDonald: Genito-Urinary Dept. 3 p.m., Dr. Scott Pinchin: Medical Out-patients.

Friday.—10 a.m., Mr. Dudley Buxton: Dental Dept. 2 p.m., Dr. Burrell: Medical Out-patients. 2 p.m., Mr. Banks-Davis: Nose, Throat, and Ear Dept.

Saturday.—Dr. Paterson: Diseases of Children (Medical).

Daily, 10 a.m. to 6 p.m. Saturdays, 10 a.m. to 1 p.m. In-patients, Out-patients, Operations, Special Departments.

Births, Marriages, and Deaths.

BIRTHS.

Carlill.—On August 15th, at North Gate, Regent's Park, Mildred (née Godfrey), wife of Hildred Carlill, M.D., of Harley-street—a daughter.

Gauntlett.—On August 17th, at 18, Walker-street, Edinburgh, to Hilda Mary (née Gerrard), wife of Eric Gerald Gauntlett, C.B.E., D.S.O., F.R.C.S., of Shanghai—a son.

MARRIAGES.

Geldart—Dixon.—On August 14th, at Holy Trinity, Loddon, Norfolk, Richard Morton Geldart, M.A. Camb., M.R.C.S., L.R.C.P., of Worthing, Sussex, to Margaret Lucy, youngest daughter of Rev. and Mrs. Dixon, of Loddon Vicarage, Norfolk.

THE LANCET

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CONTENTS

THE WHOLE OF THE LITERARY MATTER IN THE LANCET IS COPYRIGHT.

UNTERIAN LECTURE on Chronic Mastitis. By GEOFFREY KEYNES, M.D., F.R.C.S. (*With Illustrations on Special Plate.*) 439

ORIGINAL ARTICLES.

e Operative Treatment of Vesical Diverticula. By J. SWIFT JOLY, F.R.C.S. (*With Illustrations on Special Plate*) .. 445

me Observations on Striæ Distensæ. By F. BEDO HOBBS, M.B., B.Ch., D.P.H. (*With Illustration on Special Plate*) 452

me Disinfection and the Control of Scarlet Fever. By K. SIMPSON, M.D., M.R.C.P., D.P.H. (*Illustrated*) 455

BRITISH MEDICAL ASSOCIATION.

nual Meeting at Portsmouth.

tion of Neurology and Psychological Medicine: The Nervous Child.—Sequelæ of Encephalitis Lethargica.—Prognosis f Psychoses During Adolescence 457

EVIEWS AND NOTICES OF BOOKS.

mathematics: Being he Principles of Mathematics for Students of Biological Science. By W. M. Feldman, M.D., B.S., F.R.S. With n Introduction by Sir William M. Bayliss, D.Sc., F.R.S. 463

orn Errors of Metaolism. By Prof. rchibald E. Garrod, K.C.M.G., D.M., LL.D., F.R.S., F.R.C.P. 464

Debt of Medicine to he Fine Arts. By J. A. ixon, C.M.G., M.D., F.R.C.P. 464

ndzüge der Lichtiologie und Lichtathologie. By Prof. Walther Hausmann 464

Handbuch der mikrobiologischen Technik. By Prof. Dr. Rudolf Kraus und Prof. Dr. Paul Uhlenhuth 465

Handbook of Physiology. By Prof. W. D. Halliburton, M.D., LL.D., F.R.C.P., F.R.S. 465

Quarterly Journal of Medicine 465

British Journal of Ophthalmology 466

American Journal of Ophthalmology 466

LEADING ARTICLES.

POST-HOLIDAY LASSITUDE 467

DIVERTICULUM OF THE BLADDER 467

OPERATIONS ON THE CARDIAC NERVES IN ANGINA PECTORIS 468

THE FOURTH YEAR OF THE HEALTH MINISTRY 469

JOINT ACTION AGAINST VENEREAL DISEASES .. 469

ANNOTATIONS.

British Association at Liverpool 470

Dust Inhalation and Pulmonary Disease 470

British Journal of Anæsthesia 471

Free Insulin 471

The Histological Study of Neoplasms 471

Cardio-Vascular Complications of Kyphoscoliosis .. 471

Life Assurance and Syphilis 472

Edible Fungi 472

Value in Disinfection 472

The Sedimentation Rate in Acute Infections 473

The Decline of Venereal Disease in Denmark 473

MODERN TECHNIQUE IN TREATMENT.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

XXXIV.—The Treatment of Anæsthetic Sickness. By J. BLOMFIELD, M.D. 474

SPECIAL ARTICLES.

Cancer: Memorandum of Departmental Committee of Ministry of Health .. 479

Notes from India: Women's Medical Education: New Madras School.—Famine Code Revision 475

Berlin: Prophylaxis of Measles.—Medical Men and the Profiteering Act.—Threatened Strike of Club Doctors 476

Ireland: The Elections.—Food Prices in Dublin.—Increase of Admissions at a Mental Hospital .. 478

THE SERVICES.

Royal Naval Medical Service.—Royal Army Medical Corps.—Royal Air Force.—Indian Medical Service 478

PUBLIC HEALTH SERVICES

Reports of Medical Officers of Health: Chelsea.—Deptford.—Fulham.—Hampstead.—Kensington.—Paddington.—Poplar.—St. Marylebone.—St. Pancras.—Southwark.—Westminster ... 481

CORRESPONDENCE.

Ophthalmological Training for Medical Students (Dr. Ernest Thomson) .. 484

The Imperial Cancer Research Campaign and the Cancer Problem (Maj. Leonard Molloy, M.P.) 484

X Rays in Exophthalmic Goitre (Mr. A. J. Walton) 484

Scholarship in Medicine (Dr. Richard Gillbard) .. 484

A National Pathological Museum (Mr. J. Jackson Clarke) 484

Differential Diagnosis of Small-pox and Chicken-pox (Dr. J. W. Tomb) .. 485

Spasm of the Larynx (Sir James Dundas-Grant) .. 485

A Defence of the Foramen of Magendie (Prof. F. Wood Jones) 486

Heart Disease in Early Life (Dr. G. Arbour Stephens) 486

Rest and Exercise in the Treatment of Pulmonary Tuberculosis (Dr. W. E. Waller) 486

Pensions in the Indian Medical Service 486

Factory Girls' Country Holiday Fund 492

Medical Account-Keeping Simplified (Dr. W. W. Hardwicke) 492

MEDICAL NEWS.

Society of Apothecaries of London 487

Conjoint Board R.C.S.Eng., R.C.P. Lond.: Admission to Final Examination 487

Royal College of Physicians of Edinburgh: Parkin Prize 487

Faculté de Médecine de Paris 452

Sussex Provident Scheme. 463

Registration of Health Visitors in Scotland 478

Alexandra Day at Brighton and Hove 486

University College Hospital 487

Fellowship of Medicine and Post-Graduate Medical Association 487

St. Mary's Hospital 487

Museum of the Royal College of Surgeons of England 487

St. John's Hospital for Diseases of the Skin 487

London Medical Exhibition 487

Cancer Research in Manchester 487

Laura Spelman Rockefeller Memorial 487

Donations and Bequests .. 488

Royal Medical Benevolent Fund 488

Langho Epileptic Colony .. 489

NOTES, COMMENTS, AND ABSTRACTS.

Public Health in Bengal .. 489

Voyage d'Etudes Médicales 491

Convalescent Care on a Large Scale: The Work of the Burke Foundation, New York State 491

Ripening and Rotting of Hard Fruit 492

Medical Diary 488

Appointments 488

Vacancies 488

Births, Marriages, Deaths 489

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The epithelial lining of the mammary gland consists throughout of one layer of epithelial cells, beneath which is a layer of smaller, more or less flattened, supporting cells. In the main ducts the cells of the glandular layer are columnar or cylindrical in shape, and these give way, as the ducts branch, to cells which are more definitely cubical. The transition from columnar to cubical is not abrupt but very gradual, and it is difficult, or impossible, to say where duct ends and acinus, or true secretory tissue, begins. The truth is, I believe, that all the cells participate in the secretion, and the difference lies rather in the chemical composition of the secretion than in their morphology. Even in the immature breast, which contains only the large collecting ducts, these ducts are filled with a fluid secretion.

Several modifications in shape are seen in a duct as it passes from the surface of the nipple to the interior of the breast. These changes appear to me to be of great, though imperfectly appreciated, importance in the pathology of the diseases of the breast. I wish to draw particular attention to the manner in which the ducts open on the surface of the nipple. In the accompanying drawing (Fig. 1 on Plate) it will be seen that the actual mouth of the duct is a funnel-shaped structure lined with ordinary squamous epithelium. These squamous cells extend for a considerable distance below the surface of the nipple, and in the inactive breast the point at which they end—that is, at the neck of the funnel—the lumen of the duct becomes extremely narrow and is usually almost obliterated. Immediately beyond this point there is an abrupt transition from squamous to columnar epithelium, and at the same time the duct suddenly opens out, the lumen becoming wider than at any other part of its course. This part forms the ampulla of anatomical nomenclature. The walls of the ampulla, unless it be greatly distended with secretion, are irregularly folded, and so it can adapt itself to wide variations in content.

A further point which I wish to emphasise is the fact that the funnel-shaped mouth of the duct is lined with an epithelium which normally keratinises on the surface. These keratinised layers inevitably tend to accumulate in the depression formed by the funnel, and I have found that in the non-lactating breast the mouths of the ducts are, almost without exception, filled by a laminated plug of keratinised epithelium. I have examined a very large number of nipples, both by making longitudinal sections and by serial transverse sections. In a longitudinal section the plug can be seen to form a cone-shaped cast of the mouth of the duct. In a transverse section (Fig. 2 on Plate) the laminated plug is well seen. As soon as the narrow neck of the funnel has been passed the plug disappears and the duct opens out again, as has already been said. The mouth of the duct in a lactating breast forms a striking contrast to this. The narrow neck is now widely open, and the epithelial plug, except for a few layers at the periphery, has disappeared. Sections of the nipple also show the large amount of unstriped muscle tissue, disposed rather irregularly in small bundles, which this structure contains. The contraction of this muscle is presumably largely responsible for the narrow neck of the funnel. In any case it is clear that no secretion present in the ampullæ of a non-lactating breast is normally allowed to escape. The duct therefore becomes additionally sealed by a firm epithelial plug. This may be accentuated by the retraction or deformity of the nipples which is often found to be associated with chronic mastitis, and is by no means to be regarded as a sign diagnostic of carcinoma.

Normal Physiology of the Breast.

It may seem at first somewhat superfluous to devote a special section of a paper on the pathology of an organ to a consideration of its normal physiology; but in the case of the breast I believe the latter to be to a large extent the key to its pathology. I have hitherto spoken of the breast as a gland either inactive or functioning—that is, lactating; but I now wish to put forward the view that the breast is a gland which throughout life is exhibiting some secretory activity, the difference between a lactating and a non-lactating breast being one partly of degree and partly of the chemical constitution of the secretion.

The physiological history of the mammary gland begins at birth, when there is often an abortive attempt to fulfil its ultimate function of lactation. This may be called clinically an "infancy mastitis," and is presumably to be explained by the fact that both fœtal and maternal breasts are subjected to the same hormonic stimulus. I have no knowledge of the histological appearance in such a case, but I do know that in many of the sections of breasts of young children that I have seen, the ducts are considerably distended with secretion, which may be taken as evidence that the cells of the immature gland have some functional activity. The clinical condition of mastitis is not, however, often seen in children between infancy and the age of 11 or 12, but from this time onwards the physiology of the breast is very intimately connected with that of the sexual glands. After the age of 11 in girls and 13 in boys the condition of "puberty mastitis" is very commonly seen. There is a painful swelling of one or both breasts, which, though not acute, may persist in boys for two or three years and then disappear. In girls it passes into the phase of normal hypertrophy which attends the attainment of sexual maturity.

In girls, with the arrival of sexual maturity the mammary glands enter upon a phase of permanent semi-activity, and are subjected to a constantly recurring physiological stimulation which is repeated in varying degrees at frequent intervals for a period of at least 36 years. At every menstrual period the glands are acted upon by hormones from the sexual glands, which awaken some sort of activity in the epithelial cells. In many women this may pass unnoticed. Many others are painfully conscious of the process and may be led to consult a doctor about it, who will perhaps make a diagnosis of "chronic mastitis." The condition should perhaps rather be called at first "menstrual mastitis," though as time goes on the physiological state becomes more and more difficult to distinguish from the pathological. In the event of pregnancy becoming established, the menstrual cycle is for the time being abolished, and a different form of hormonic stimulation is substituted. In response to this the cells enter upon their full functional activity, and a period of enormous hypertrophy, culminating in lactation, follows. Lactation is succeeded by a process of shrinkage, during which the cells of the hyperplastic gland largely disappear and are absorbed—unless further pregnancies follow in quick succession, in which case the gland may be almost continuously active for several years.

At about the age of 48 the possibility of further pregnancies comes to an end, but the phase of the climacteric may subject the mammary glands to a series of irregular hormonic stimuli, which only cease with the final establishment of the menopause. Then, and then only, are these glands allowed to rest, and I believe that in strict normality an almost complete atrophy of glandular tissue gradually takes place. First the acini disappear, then the small ducts, and finally only the largest collecting ducts remain. Even in these the cells are small, and the lumen greatly shrunken. The connective-tissue framework may also become reduced in bulk, though the external appearance of the breast would often belie this owing to its becoming infiltrated with fat. After the menopause, therefore, and in old age, there is no true physiology of the breast to record, but too often a physiological process has become merged in a pathological condition, which probably has had its origin many years before. A physiological stimulus may amount to a pathological insult if only it is repeated often enough. It may be asked why I have chosen to dwell in such detail upon a series of physiological commonplaces. My object has been to emphasise the fact that the epithelial cells of the breast are producing some sort of secretion almost continuously for many years. I have already demonstrated that, except during lactation, the mouths of the ducts are not normally patent, and that no secretion can escape. The physiology of the breast entails, therefore, not merely secretory, but also continuous absorptive, activity. I shall return later to the bearing of this upon the pathology of chronic mastitis.

HISTOLOGICAL EVIDENCE OF MASTITIS.

I now turn to a description of the histological changes which I believe to be indicative of the presence of chronic mastitis. I can but describe each one in turn; it must be understood, however, that all may be seen at once in one small area, though as a rule their relative distribution in the breast is very erratic. If, as the name of the disease implies, it is an inflammatory condition, then it would be expected that one of the cardinal signs of inflammation, infiltration of the connective tissues with leucocytes, would invariably be present. Actually, the presence of round cells is not an invariable sign, or, at any rate, all parts of the diseased breast are not equally affected.

It is, however, evident that the round-celled reaction is more intense when the lumen of the acini or ducts that they surround is filled with a fluid rich in disintegrating cells or fat-containing secretion. The mere presence of epithelial changes certainly does not on the whole tend to determine a concentration of leucocytes. It is the presence of dead cells or inspissated secretion which attracts them most strongly. The microscopic appearances suggesting *inflammation* are therefore indirectly produced by interference with the escape of the products of epithelial activity from ducts and acini. The most extreme condition of leucocytic infiltration that I have found was in the breast of a woman who became pregnant after having developed an advanced chronic mastitis. The breast attempted to lactate, but the secretion was unable to escape normally, and re-absorption of the milk was only effected with an intense inflammatory reaction. A similar condition, which may be called a "stagnation mastitis," is seen clinically in a woman who has for some reason been compelled to cease suckling her child soon after its birth. Re-absorption of secretion is then attended by acute pain and inflammation, which may initiate a chronic mastitis and give rise to considerable suffering in a subsequent pregnancy. It is important to note what type of cell is most commonly found, and it is clear that the lymphocyte nearly always predominates. In the extreme case mentioned there were also a good many polymorphonuclear cells, and in another there were large numbers of eosinophil cells producing a very unusual appearance.

The presence of fibrosis is another change seen in the interstitial tissues which is very capricious in its distribution. Often the first evidence of true fibrosis is seen as an increase in the density of the layer of fibrous cells immediately outside the ducts or acini. In sections stained with eosin this is seen as a conspicuous red rim round these structures, consisting of several layers of connective-tissue cells. In another form of fibrosis the area of loose and transparent connective tissue round the groups of acini tends to become contracted or to disappear altogether. The eosin staining then extends evenly right up to the acini. In a later stage the epithelial cells may disappear and be replaced entirely by fibrous tissue arranged as a group of small whorls, each whorl presumably representing an acinus. This appearance tends to resemble the arrangement of fibrous tissue seen in a fibro-adenoma intracanaliculare, and that, after all, is probably the late stage of an originally glandular tumour in which the fibrous tissue has become predominant at the expense of the epithelial cells.

Dilatation of ducts and acini is a change that almost always accompanies chronic mastitis, but it is difficult to judge at what point the process is to be regarded as pathological. For it is quite normal to find a dilatation of the large collecting ducts and ampullæ which can be seen with the naked eye when the breast is sliced, and this is only to be expected in a secreting gland which has no outlet except when lactating. As the secretion accumulates, this distension may be communicated to the smaller ducts and finally to the acini, which normally have only a very small lumen; but clearly there is no criterion indicating definitely the point at which the process becomes pathological. I have therefore not been able to use any particular standard. Each section has been judged on its merits. The formation of small cysts which can be felt with the fingers is characteristic of chronic mastitis, but this is only a more advanced stage of a change which can at first only be appreciated under the microscope. The presence of large cysts lined by flattened epithelium and filled with a clear greenish fluid, a turbid milky fluid, or a cheesy mass is also characteristic of a still later stage of mastitis. These advanced changes are presumably associated with obstruction to a duct by fibrosis, cellular proliferation, or pressure; but I have not been able to demonstrate this in relation to any particular cyst.

The epithelial changes in chronic mastitis are more definite and more easily identified than those described so far. The changes appear to me to be of two different types. In one type the change is primarily an enlargement or swelling of the cells without very much active proliferation; in the other the cells do not always undergo any alteration in size, but simply proliferate in varying degrees, forming either the "laciform proliferation," so named by Sir Lenthal Cheatle, or "massive proliferation," solid lumps or columns of cells filling and distending the spaces originally occupied by the acini or ducts in which the process arises. The first change may be partly degenerative, but it is not connected with the so-called "involution changes" seen in the breasts of women who have passed the menopause, for I have found it at all ages from 16 upwards. Nor do the cells show any fatty changes in their cytoplasm when tested with the special fat stains. It seems, on the other hand, to be associated with some form of irritation, and may occur in patches (Fig. 3 on Plate). In most instances the change seems to spread and involve the glandular tissue of neighbouring groups.

The second type of cellular change is, as I have said, primarily a proliferative change, and clearly indicates a much greater activity in the cells. Often, as proliferation proceeds, some of the cells are cast off and disintegrate. When these have disappeared a "laciform" appearance will presumably result. This is not in any essential particular different from the massive proliferation seen in Fig. 4 (on Plate), where the outlines of a few acini can still be made out.

Another change which seems to be closely associated with the cellular changes already described takes place chiefly in the larger ducts, and results in the formation of true papillomata. The first stage of this is shown in Fig. 5 (on Plate), where the wall of a distended duct is seen to be sprouting small excrescences all round its circumference. Such papillomata are commonly found in the ducts close to the nipple and their presence often gives rise to a clear or blood-stained discharge from the nipple, and this usually attracts the patient's attention. But I do not believe that such a papilloma ever occurs as an isolated phenomenon. The signs of chronic mastitis would certainly be found in other parts of the breast if search were made for it.

Summarised in as few words as possible the histological changes seen in chronic mastitis are: round-celled infiltration, fibrosis, dilatation, epithelial changes of two kinds, and formation of papillomata. In the early stages of the disease some degree of fibrosis, as described here, some degree of dilatation of the small ducts or acini, and a few patches of round cells are the chief histological evidences of its presence. In the later stages all these changes become accentuated and are associated with one or both of the forms of epithelial change. Sometimes the leucocytic activity appears not to be accentuated at this stage, but may, on the other hand, be almost absent. In the stage at which operation is performed the slight dilatation has usually culminated in the formation of large cysts, but at this point the condition is given a number of different names indicating supposedly distinct diseases. The laciform or massive proliferation clearly indicates that a profoundly abnormal activity has been somehow induced in the epithelial cells, and this may be of the greatest importance in considering the question of malignancy. This will be discussed later.

Age- and Sex-Incidence of Pathological Changes in the Breast.

One object of this investigation was to ascertain, if possible, at about what age the changes of chronic mastitis first become apparent. It is difficult, however, to obtain accurate facts from statistics based on the relatively small numbers to which I was necessarily limited. The post-mortem room material provided 116 specimens, of which 57 were normal and 59 showed inflammatory lesions. In the accompanying chart is shown the percentage, in every decade, of individuals having positive signs of chronic mastitis. It will be seen that the lesions first become apparent in the second decade, and rise to a maximum in women aged 40 to 50. It is, of course, possible that the figure of 18 per cent. in the second decade would be lower if I had more material on which to base it. Also I feel quite sure that the extreme irregularities seen in the graph after the age of 60 are quite misleading, the number of cases beyond this age that were investigated being very small. I have therefore shown this part only in dotted lines. It is evident from this diagram that chronic mastitis is not a disease of the climacteric only, as has sometimes been supposed. It may have had its beginnings 30 years before this, though it is most apt to become clinically obvious at the later age.

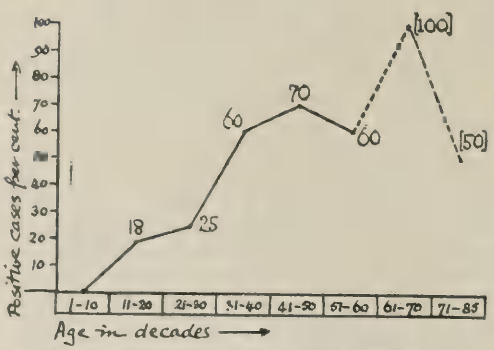

Chart showing percentage in every decade of persons having positive signs of chronic mastitis.

Post-mortem room material also gives some indication of the influence of lactation upon the incidence of chronic mastitis. Details of family history had not been recorded in all cases, but the figures as far as they could be ascertained were as follows:—

Post-Mortem Room Material.

Average age of all positive cases	unmarried or childless ..	43 years.
	parous women	51 ,,

A similar impression is obtained from the series of cases which had developed manifestations of mastitis necessitating operation. The youngest unmarried patient in this series was 24. The youngest married patient was 46. The average ages were as follows:—

Operation Material.

Average age of unmarried patients.. ..	37 years.
,, ,, married patients	46 ,,

It seems to be clear that chronic mastitis tends to appear nearly *ten years* earlier in single women than in those who have borne children.

I have so far referred only to the incidence of chronic mastitis in the female sex. It is well known, however, that males may suffer from all the same affections of the mammary glands as females, though very much less commonly. The early physiological types of inflammation in the breast—namely, infancy and puberty mastitis—occur almost as often in boys as in girls. Afterwards the breast in the male becomes quiescent. In later life, however, men may develop in their breasts all the same conditions as are seen in women. Ordinary chronic mastitis is not very rare in old men. Sometimes cysts, papillomata, and so forth are developed, and may necessitate operation. A definite percentage of cases of carcinoma of the breast is found in men. I thought it worth while, therefore, to examine a series of male breasts from the post-mortem room, in order to find out how often the changes of chronic mastitis were to be found. I have examined 37 specimens, and found some changes in four of them. In one of these, from a man of 38, the picture was that of a well-developed chronic mastitis. Some of the ducts were enormously dilated, and the secretion contained large numbers of cells. In some places there was swelling and desquamation of the epithelial cells, and there were numerous patches of round-celled infiltration. The average age of the four patients was 54. It was noticeable that almost every specimen showed that the ducts had a wide lumen and contained secretion, so that the conditions very closely resemble those found in women. It must be remembered, however, that the gland tissue in the male is represented only by the largest collecting ducts. In the female breast the changes of mastitis are seldom seen in these large ducts, but are almost always in the smaller ducts or acini, which do not exist in the male. It may be, therefore, that the epithelium of the large ducts is for some reason less vulnerable, and so less liable to pathological changes, than that of the more truly glandular tissue. Perhaps it is partly to this that the male breast owes its comparative immunity from disease. It is also less subject to irregular hormonic stimuli.

Theories of Causation.

As indicated at the beginning of this paper, the idea of the causation of chronic mastitis that has commonly held the field is one involving the presence of some obscure bacterial infection. I cannot, however, discover any evidence in favour of the view that the inflammation is bacterial. All that I can gather seems to show that bacteria take no share in the disease.

I have shown, I believe conclusively, that the normal breast has, except during lactation, no outlet through the nipple. The mouths of the ducts are mechanically closed a little way below the surface by muscular contraction which reduces the lumen almost to nothing. They are in addition sealed by a firm plug of epithelium, reinforced by sebaceous secretion, a substance which is known to be unfavourable to the growth of bacteria. It seems very unlikely, therefore, that any foreign substance could obtain entrance through the nipple. It cannot be claimed that lactation affords an opportunity for infection from without, since the changes of chronic mastitis are so often found in breasts which have never lactated. There is the alternative supposition that bacteria may have been brought to the breast by the blood-stream. In the case of a tuberculous infection this undoubtedly happens, and presumably a pyogenic infection may occasionally occur in the breast in the course of a blood infection, as may happen in any other part of the body; but it is difficult to believe that every one of the vast number of women afflicted with chronic mastitis has pyogenic bacteria circulating in her blood in numbers large enough to produce a diffuse lesion in both breasts.

In either case it should be possible to recover these bacteria from a breast showing a well-marked degree of mastitis; but this I have invariably failed to do. Also the histological appearances do not suggest the presence of bacteria. Bacterial infection is almost invariably accompanied by a leucocytic reaction. This, as has been said, is often absent in chronic mastitis. Also the leucocyte characteristic of pyogenic infection is the polymorphonuclear cell. In chronic mastitis it is always the lymphocyte which is present, almost to the exclusion of polymorphonuclear leucocytes. Nothing can be inferred from the presence in one case of large numbers of eosinophil leucocytes.

I have mentioned that enlargement of the axillary lymph glands is often associated with chronic mastitis, but this cannot be interpreted as necessarily indicating bacterial infection. Absorption of any toxic products, bacterial or non-bacterial, may produce signs of lymphadenitis in the glands draining the affected area. It seems reasonable, therefore, to reject the bacterial theory of causation on the ground that there is no evidence to support it. Another theory which has been advanced suggests that chronic mastitis may be caused by a general toxæmia, the source of the toxin being a site of bacterial activity in some part of the body. Thus it was observed by C. B. Lockwood[1] many years ago that the symptoms of an inflammatory tumour in the breast disappeared after the removal of a source of infection, such as an infective vaginitis. More recently, affections of the mammary gland have been connected with intestinal toxæmia by W. S. Bainbridge.[2] But judgment as to the possible connexion between chronic mastitis and chronic toxæmia must be suspended until more precise evidence than is given by these authors is forthcoming. Another condition which has been held by many writers to be responsible for chronic mastitis is one that is termed "involution change"; but after lactation this change is probably passive in most respects, and according to the most recent view[3] results partly from a lessened blood-supply, and partly from the pressure produced by the secretion which is no longer removed as it is formed. This effect may be aided by bandaging. Under these conditions the epithelial cells undergo autolysis or self-digestion, the products of this metabolism being then removed by way of the lymph- or blood-stream. In this way the hypertrophied organ is removed piecemeal in a relatively short time, until nothing but the ducts with their normal proportion of branches and acini remain. It is difficult to see how any abnormal cellular processes could be initiated in this manner. It is often stated also that involution changes take place at the menopause, and this statement is associated with the quite erroneous dictum that chronic mastitis is "a disease of the climacteric." It is true that the symptoms of the disease are clinically most obvious at that time, because the cause of the mastitis, whatever it may be, has by then been in operation for a number of years, and also because the breast is at that time being subjected to very irregular hormonic stimuli. The disease must in all cases have begun many years before this, and I see no justification whatever for supposing that the "involution changes" attending the menopause have any connexion with the disease. Moreover, these so-called involution changes are, as I have so often seen them under the microscope, usually nothing more than a simple atrophy. In a breast which has not developed any marked degree of chronic mastitis with cyst formation or abnormal epithelial activity, the acini become smaller and smaller, the lesser ducts tend almost to lose their lumen, and finally most of the glandular lobules disappear altogether. The large ducts always remain, and usually contain secretion; but, except for these, a normal senile breast consists almost exclusively of fibrous connective tissue, which in stout subjects becomes infiltrated with large quantities of fat. There does not seem, therefore, to be much evidence in favour of the involution theory of chronic mastitis, and I think it should be abandoned.

Finally, it has been suggested that trauma may have some influence in initiating a chronic mastitis. I have shown, however, that the changes seen in this disease are diffuse, and clinical experience teaches that the condition is very often bilateral. It is, further, difficult to suppose that any woman could pass 40 years of her existence without being subjected to the ordinary accidents of everyday life, so that a history of trauma can always be obtained by questioning closely enough. Trauma is, in fact, so vague a factor that I do not think it need be further considered.

CAUSE OF MASTITIS TO BE FOUND IN PHYSIOLOGICAL PROCESSES IN THE BREAST.

My consideration of the possible causes of chronic mastitis has been so far purely destructive. I now wish to offer a constructive solution of the problem, which is, however, not yet susceptible of proof. Causes outside the breast do not seem to offer any real help. May there be then any cause within the breast itself? I think the answer to this question is that there may indeed be a cause within the breast, arising in the first place from an inherent defect in its anatomical construction, which reacts in its turn upon the normal physiological mechanisms. It has already been demonstrated that the non-lactating breast is an organ which is subjected to continual physiological stimuli, but which has no outlet for the products of its own activity. A re-absorption of secretion must, therefore, continually be taking place. In addition to this the epithelial lining of both ducts and acini is being constantly renewed and effete cells are being cast off into their lumen. These cells disintegrate and must somehow be removed unless the breast is to become a stagnating mass of epithelial débris. All the available evidence seems to me to point to the fact that the breast is itself continually pouring into the lumen of its ducts and acini a possible source of irritation to which all the pathological changes that I have reviewed may be attributed. Should there be a partial failure in the process of re-absorption of fluid and scavenging of epithelial débris, then any such irritation will become accentuated. This in its turn will further interfere with absorption and may initiate abnormal cellular activity, and so a vicious circle will become established.

I do not pretend to be able to suggest exactly what factors in the body may disturb the physiological balance of secretion and re-absorption. In some individuals the balance may be maintained throughout life. In others—probably the majority—it is upset after being successfully maintained for a considerable number of years; even then there are very wide variations in the degree of irritation produced, and this variation occurs not only as between individuals but also in different parts of the same breast. The variation may be both in the concentration of the irritants formed in the secretions and in the susceptibility of the cells exposed to its action. The reaction of one individual may lie chiefly in the direction of fibrosis; in another it may produce the various forms of abnormal epithelial activity which have already been illustrated. In one case the results of irritation may become apparent after it has been acting for a relatively short time; in another it may be 30 or 40 years before any pathological change can be appreciated. But whatever the source of irritation may be, it is clear that the time factor is of great importance. It has been very commonly observed that an advanced degree of chronic mastitis is seen at an earlier age in women who have never borne children than in women who have passed through the healthful process of pregnancy and lactation, and this is confirmed by the figures already recorded. The explanation of this is to be found in the fact that during lactation the mouths of the mammary glands become unsealed, and the products of activity are removed. If a woman has a large family of children, this natural drainage is established with intermissions for a period of many years, and only as middle age approaches do the breasts again begin to feed upon themselves. For this reason chronic mastitis has been called a disease of the climacteric; but the condition really had its first beginnings when lactation ceased for the last time, perhaps ten years before.

It is worth remarking that recent investigation of the functions of the lymphocyte, the cell so characteristic of chronic mastitis, tends to confirm indirectly this interpretation of the source of irritation in the breast. The lymphocytes in chronic mastitis are, as has been said, very erratic in their distribution, but they are in maximum concentration in a lactating breast when there is any interference with the free escape of milk, and apart from lactation tend to be most numerous in relation to ducts or acini containing much cell débris or fatty secretion. This gains significance from the conclusion arrived at by Dr. S. Bergel,[4] that lymphocytes contain a lipase and are concerned in the digestion of fat and lecithin bodies both in physiological and pathological conditions. The presence and distribution of lymphocytes in the breast thus finds a natural explanation.

THE CHEMICAL PROBLEM.

This explanation of the cause of chronic mastitis in the human being is based entirely on deductive reasoning; but a little thought will show that the hypothesis fits in with all the observed facts both clinical and histological. It cannot, however, be finally accepted until the factor actually responsible for producing a state of irritation has been determined. This introduces an exceedingly difficult problem in biochemistry which can only be dealt with by those who have been specially trained in this line of investigation, and so far as I know little has been done as yet in this direction. It can easily be demonstrated that there are wide variations in the composition of the fluid which is contained in cysts of the breast, or can be expressed from the cut surface of the gland. Commonly a clear green fluid is obtained; sometimes it is brown. Sometimes the fluid is turbid with cell débris; sometimes it is milky and contains both cell débris and fat globules. Occasionally the contents of the ducts or of a cyst are cheesy or almost solid in consistency. This material may consist chiefly of enormous numbers of cast-off cells. Occasionally it may be composed almost entirely of fat, and is probably derived from inspissated milk. A cyst of this nature is known as a galactocele, and is likely to arise in a breast which has attempted to lactate in the presence of a mastitis already well established or of a carcinoma, either condition causing an obstruction of one or more ducts.

The chemical changes which may take place in these stagnating fluids are, as has been said, more or less unknown; but I feel sure that much will be learnt from the investigation of the chemistry of the secretions and of their effect upon the living cells that are exposed for a longer or a shorter time to their influence. Attention has several times been drawn to the analogy between the changes that are found in middle age in the breast and in the prostate,[5] and it is quite possible that chronic mastitis and senile hypertrophy of the prostate are dependent upon similar factors. Light may also be thrown upon abnormal epithelial growth in other organs.

RELATION OF MASTITIS TO CARCINOMA OF THE BREAST.

An immense body of literature has been devoted to the discussion of the relation between chronic mastitis and carcinoma of the breast. This seems to begin with the statement made by Billroth[6] in 1880 that "cancer does not develop in an otherwise normal breast," and culminates in the evidence published by McCarty[7] in 1915. The changes of chronic mastitis were present in every one of 967 cancerous breasts investigated by him. The opinions of many other writers tend in the same direction, and it is, indeed, an almost universally accepted idea that carcinoma of the breast is preceded by the epithelial changes of chronic mastitis. Sir Lenthal Cheatle[8] in several valuable contributions has recently tried to demonstrate this passage from innocent to malignant proliferation, and has even been so bold as to class under the heading of "the prœmial breast" a mammary gland which shows the epithelial changes previously described. But the coexistence of innocent and malignant proliferation does not prove that one necessarily precedes the other. However probable the occurrence of a "precancerous" condition in chronic mastitis may appear, it is exceedingly difficult to furnish any scientific proof of the change, and this has certainly not yet been done.

It has already been mentioned that a great many writers have recorded their observations on the occurrence of chronic mastitis in cancerous breasts, and that McCarty found the association in every one of 967 breasts. It may, in the face of this, seem futile to refer to my own observations, which have been made on only 25 specimens. But even in this short series I have been struck with one or two facts. In these 25 breasts I have found some evidence of chronic mastitis at a distance from the carcinoma in 20, that is 80 per cent. Of the remaining five, three had been infiltrated throughout with the carcinoma, and one was, in addition, lactating, so that it was not possible to form any opinion as to whether chronic mastitis had been associated with the carcinoma or not. It seems to me very extraordinary that this same difficulty should not have occurred in McCarty's series of 967 specimens. The remaining two specimens of my series showed only a senile atrophy in the outlying parts of the breast. I was not therefore able to confirm the 100 per cent. results of some observers.

Another singular fact that forced itself on my attention was that in most cases the breast tissue showed a great increase in epithelial activity close to the advancing edge of the carcinoma, but that this was progressively less, the greater the distance from the malignant infiltration. This proliferation, which resembles that seen in the proliferative type of chronic mastitis, looked as if it were in some way connected with the growth of the carcinoma in close proximity. The well-marked degree of infiltration with lymphocytes usually seen at the growing edge of the carcinoma indicated an inflammatory reaction, and strongly suggested that the malignant cell might be influencing other cells at a distance by means of an abnormal and irritating secretion which induced a cellular proliferation similar to that resulting, as I have suggested, from long exposure to secretions in chronic mastitis, though acting very much more rapidly. If this suggestion were to be substantiated it would explain the apparent association of chronic mastitis with carcinoma in so large a proportion of cases; but it would in no way demonstrate that chronic mastitis is a "precancerous" condition. I cannot offer an opinion that would carry any weight as to the precise relation of chronic mastitis to carcinoma. I can only make the suggestion that carcinoma is not necessarily preceded by chronic mastitis, but that both conditions, or either separately, may result from one cause—namely, prolonged exposure to a chemical irritant such as may be present in the stagnating secretions of the breast.

TREATMENT OF CHRONIC MASTITIS.

In considering the treatment of chronic mastitis I shall not enlarge upon the operative methods of dealing with the more advanced stages of the disease. It is clear that in the present state of knowledge it is wisest to deal radically with the fully-developed type of chronic mastitis with cysts. Complete removal of the gland is sometimes necessary, though it may be remembered that, if there is no reason to suspect the presence of a carcinoma, there is no necessity for removing much, or even any, skin, and that a subareolar operation may be carried out without fear of recurrence. This may still be done even though the massive proliferation of epithelial cells is found to be present. If the disease is apparent as a single cyst or a localised group of cysts, then a local operation is adequate. Some diffuse change will almost certainly be present in the remainder of the breast, but it is always possible that this will not develop further and will not give rise to symptoms of any consequence. The same remark may be applied to a papilloma of a duct-ampulla or to a galactocele.

The treatment of the earlier stages of chronic mastitis in which pain and tenderness, or merely discomfort, are the chief symptoms, presents a more difficult problem. Often there is a psychological factor in the symptoms, and operation is then scarcely ever to be advised. If the trouble is of the intermittent menstrual type, no medical treatment or local application is likely to be of any avail. This type occurs chiefly in young women, and the symptoms may subside of themselves as the patient grows older. Otherwise marriage, followed by pregnancy and lactation, will relieve the patient of her trouble. The more persistent type of chronic mastitis in older patients I have attempted to treat in the way which is logically suggested by the investigations here described. I have first freed the mouths of the ducts in the nipple and opened up their natural outlets by bathing with hot water. Manual pressure combined with a suction bell will then often produce a considerable quantity of the turbid or clear green fluid which is always present in the ducts and dilated acini. The patient is instructed to carry out this treatment systematically, and in a few cases some relief of pain and discomfort has been obtained. But the results are disappointing on the whole. This is not unnatural, for the chronic inflammation has produced fibrosis and other abnormalities in the glandular system, so that efficient drainage of every lobule is no longer possible. The treatment should not be persisted in unless improvement very soon results.

The best results seem to be obtained by the judicious application of X rays. If the proper dosage is applied by an expert, a single treatment will usually have a most satisfactory effect. By this means the secretory activity of the epithelial cells is inhibited or destroyed, and the treatment is again the logical outcome of the interpretation I have put upon the pathology of the disease. The treatment is not new, having often been used empirically in the past, but I have here attempted to put it upon a rational basis.

CONCLUSIONS.

1. The breast is a secreting gland which shows periodical activity from birth to the menopause.

2. The normal, non-lactating breast has no outlet through the nipple for the discharge of its secretions. Secretion must therefore be balanced normally by re-absorption.

3. Chronic mastitis is manifested by dilatation of ducts and acini, accumulation in them of the products of epithelial activity, infiltration with lymphocytes, fibrosis, and epithelial changes. The distribution of all these is very erratic.

4. Chronic mastitis is commonest in women, but occurs also in men. It first appears in the second decade, but is most often seen in the fifth. It appears earlier in single women than in women who have borne children.

5. Chronic mastitis is not bacterial in origin, toxæmic or traumatic, nor is it related to involution changes in the breast.

6. The cause of chronic mastitis is probably to be found in chemical irritation due to stagnating secretions and epithelial débris. This cannot be proved until the chemical changes have been investigated.

7. Chronic mastitis, though very often associated with carcinoma, has not been proved to be "precancerous." Both may be due to the same cause.

8. Chronic mastitis in its more advanced stages must be treated by operation. At an earlier stage natural drainage may be tried, or X rays may be applied.

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THE OPERATIVE TREATMENT OF VESICAL DIVERTICULA.*

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(*With Illustrations on Special Plate.*)

THE treatment of large vesical diverticula is one of the most difficult problems that the urinary surgeon has to grapple with. Complete excision of the sac is, at present, the accepted method of dealing with it, but as so many widely divergent views have been expressed on this subject, it may be of interest to give a brief description of 14 cases upon which I have operated, and the conclusions I have drawn as to the relative values of the different methods employed.

CASE 1.—Male, aged 51, admitted to St. Peter's Hospital Jan. 11th, 1910.

History.—He always had difficulty in micturition, and took much longer to complete the act than other people. Was catheterised in 1901. His bladder was then infected. Since then he has suffered from frequent attacks of pain in the left groin, accompanied by headache, backache, night sweats, marked frequency of micturition, and occasionally by hæmaturia. Frequency of micturition from one to two hours both by day and by night. The urinary stream was slow and weak, but he never had retention of urine. Pain during micturition felt along the urethra.

Condition on Examination.—No stricture. Residual urine 13 oz. Prostate normal; above it the bladder bulged into the rectum, but was not indurated. The bladder could be felt, when it was apparently empty, rising just above the pubis, under the right rectus; when it was distended the displacement to the right was more marked. Urine: Sp. gr. 1018, acid, albumin present, no sugar, urea 1 per cent., deposit of pus and blood. Cystoscopy: Only after a long course of daily irrigation was it possible to wash the bladder clear enough to obtain a satisfactory view. Distension 24 oz. The right ureter was displaced to the right, and the left almost to the middle line. The opening of a large diverticulum was seen above and to the left of the left ureter. It was round, and appeared to be about the size of a lead pencil. Surrounding this orifice, except at its lower part, was a polypoid mass of œdematous mucous membrane. The left ureter was dilated.

Operation.—On the 19th. Trendelenburg position; median incision from pubis to umbilicus, and a transverse one across the left rectus 1½ in. above the pubis. The operation was entirely extra-peritoneal. The diverticulum was about half as large again as the bladder. It completely filled the left half of the pelvis, and extended a short distance to the right of the middle line, pushing the bladder before it. The diverticulum was separated from the surrounding tissues, until the spine of the ischium was reached. A large vein was torn here, and as it could not be picked up and tied this part of the wound was plugged with gauze. The bladder was then opened, and the orifice of the diverticulum identified. It just admitted the first finger, and was about an inch above and to the left of the left ureter. With one finger in the opening the wall of the diverticulum was divided close to the bladder. This incision was carried round the orifice, and the diverticulum was separated from the bladder. This brought the left ureter into view. It was about as thick as the finger, and curved forwards, immediately below the diverticular orifice to its entrance into the bladder. In this portion of its course it was compressed between the diverticulum and the bladder. The diverticulum was now rapidly freed from the remaining adhesions to the rectum and prostate, and removed. The bleeding-points were picked up and ligatured, the wound partially closed, and the bladder and pelvis drained.

Course of Case.—Convalescence was slow and a suprapubic fistula, which tracked down to the diverticular opening, persisted for almost three months. It then closed, but after a short time broke down again. On June 8th he was again admitted to hospital and the sinus excised; at the same time the prostate was enucleated, though it did not appear to be enlarged, as it was thought to have been the cause of the persistent sinus. After this operation the fistula remained closed. In 1913 he was again admitted to hospital and a suprapubic hernia was cured by the filigree method.

This patient eventually died in December, 1920, almost 11 years after his operation, of chronic pyelonephritis, which persisted in spite of treatment. During this interval he had practically no frequency or difficulty in micturition, but there was always a quantity of about 3 oz. of residual urine. The diverticulum, after it was hardened, was about the size of a large orange. Its walls were one-eighth of an inch thick, and were composed of three distinct layers of muscular tissue, lined with transitional epithelium, which was much altered by inflammation (Fig. 7 on Plate).

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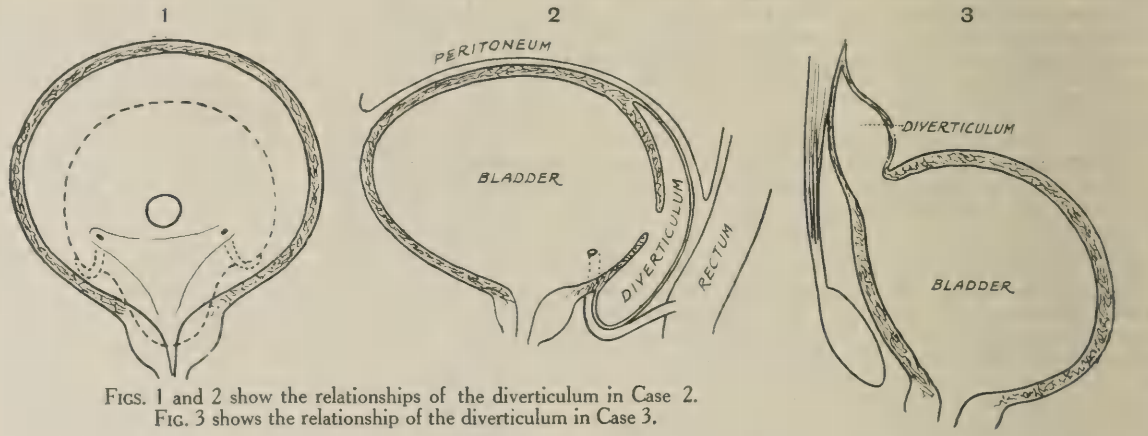
* Read before the Section of Urology, Royal Society of Medicine.

Case 2.—Male, aged 53, admitted to St. Peter's Hospital, March 19th, 1912.

History.—Gonorrhœa 30 years before. Developed a stricture, which was easily dilated. Passed a bougie on himself twice a year, but the second time he did so he infected his bladder. Since then had several attacks of cystitis, and his urine always remained turbid.

Condition on Admission.—Slight frequency of micturition. Stream good, some straining towards the end. Occasionally micturition à deux temps. Stricture admitted 17 F easily, and was fully dilated in two sittings. Prostate normal, but a soft elastic swelling could be felt above it. Residual urine varied from 12 to 16 oz. Urine: Sp. gr. 1018, acid, no albumin or sugar, urea 1·9 per cent., deposit pus and bladder epithelium. Cystoscopy: Slight general cystitis. Both ureters normal, clear efflux from both sides. Above the inter-ureteric bar and immediately to the left of the middle line was the opening of a large diverticulum. It was oval in shape with the long axis directed vertically. The cystoscope was introduced into the diverticulum. Its walls were a deep red colour, smooth, and no vessels were visible.



Figs. 1 and 2 show the relationships of the diverticulum in Case 2.
Fig. 3 shows the relationship of the diverticulum in Case 3.

Operation.—On the 22nd. Trendelenburg position. Bladder washed out, emptied as much as possible, and distended with air. Median incision from pubis to umbilicus; peritoneum opened. The diverticulum appeared like an immense bleb on the posterior wall of the bladder, to which it was adherent over a circular area about 3 in. in diameter. The bladder was then opened and it was found that the diverticulum was completely filled with a mixture of urine and lotion. This was mopped up. As it was impossible to find any line of cleavage between the bladder and diverticulum the former was split from front to back. The posterior part of this incision surrounded the orifice of the diverticulum, which was excised. The whole of the epithelial lining of the diverticulum was then removed, also the greater part of its outer wall, leaving only two peritoneum-covered flaps large enough to cover the raw surface. These were stitched in place, and the bladder wound sutured except for a small space left for a drainage-tube. The peritoneal cavity was then closed and the abdominal walls sutured. The ureters first passed downwards between the bladder and the diverticulum, then backwards beneath it, and finally upwards along its posterior surface. They formed ridges visible on the inner surface of the sac, and divided its lower portion into three pouches, a median and two lateral. The deepest portion of the diverticulum reached the level of the middle of the prostate. Its walls were very thin and were composed of a single sheet of muscular tissue lined by epithelium (Figs. 1 and 2).

Course of Case.—The patient bore the operation well and left hospital in four weeks with his wound firmly healed. He returned in three months with a urinary fistula in the scar. He was admitted and the fistula was excised. Since then he has had no further trouble. He was last seen about two years ago. There was no frequency of micturition. The urethra admitted a No. 26 F instrument easily. Cystoscopy: Slight general cystitis. A puckered scar occupied the site of the old diverticular opening, from this a linear ridge ran forwards to the apex of the bladder. Residual urine 2 oz. The urine was slightly cloudy and contained pus and colon bacilli.

Both these cases have already been reported.[1]

Case 3.—Male, aged 49, admitted to St. Peter's Hospital Sept. 2nd, 1912.

History.—Patient was treated for stricture 20 years before. In 1901 he was sounded for stone, but none found. Since then he had an attack of hæmaturia about every six months. For the last few months hæmorrhage at the end of almost every act of micturition. Old-standing cystitis and pyelonephritis.

Present Condition.—Frequency, every hour by day, six or seven times at night. Stream fair, precipitancy, never retention. Urethroscopy: No stricture. Residual urine, 11 oz.; prostate normal. Cystoscopy: Intense cystitis, especially on the base of the bladder. Ureters not visible. Opening of a large diverticulum near fundus just to the left of the air bubble, and of a smaller one to the right of the middle line on the posterior wall. Urine: Sp. gr. 1010, alkaline, albumin present, no sugar, blood small quantity, urea 1·8 per cent., sediment muco-pus.

Operation.—On the 4th. Bladder washed out and distended with air. Suprapubic incision, bladder exposed. Patient then put in Trendelenburg position and peritoneum opened. Diverticulum at apex of bladder running up into urachus. Peritoneum stripped off upper surface of the bladder and off diverticulum. Peritoneal cavity then closed. Bladder opened in middle line, incision prolonged upwards so as to surround diverticular opening. Urachus clamped and divided half way between pubis and umbilicus and diverticulum removed. At this point the urachus was found to be patent and filled with fæculent-looking material. It was followed up to the umbilicus and entirely removed. Bladder sutured round a large tube and abdominal wound closed. Diverticulum on the posterior wall only admitted tip of index finger and was not removed. (Fig. 3 represents the relationship of the diverticulum.)

Patient died, on the twentieth day after operation, of chronic pyelonephritis.

Case 4.—Male, aged 61, admitted to St. Peter's Hospital March 10th, 1915.

History.—Had been treated for stricture on and off for 30 years. Urethroscoped in the out-patient department and no stricture found. Had a poor urinary stream all this time.

Present Condition.—Frequency of micturition every two hours by day, twice at night. Stream poor, straining, stream often interrupted, no precipitancy. Patient had numerous attacks of retention which necessitated catheterisation. No pain except slight scalding on micturition. Cystoscopy: No cystitis, both ureters normal. Orifice of a fair-sized diverticulum above and to the outer side of the right ureter. Prostate slightly enlarged. Residual urine, 2 oz. Urine: Clear, acid, sp. gr. 1018, no albumin or sugar, urea 1·7 per cent., no deposit.

Operation.—On the 12th. Trendelenburg position. Usual suprapubic incision. Diverticulum found to be about the size of a walnut. Freed from adhesions outside the bladder, invaginated into it, and cut away. Gap in the bladder wall sutured with continuous catgut. Prostate enucleated. Bladder closed round a large tube, lateral space drained.

Course of Case.—During convalescence patient developed double epididymitis. Discharged on May 9th. Wound firmly healed. Urine clear, no residual. Frequency four hours by day, once at night.

Case 5.—Male, aged 63, admitted to St. Peter's Hospital April 14th, 1915.

History.—For five years frequency of micturition, sometimes every half hour. Suprapubic lithotomy March, 1914, passed stones soon after his return home. Passed as many as 13 in one day. Litholapaxy in September, 1914, and again in October, 1914. Passed more stones after both these operations.

Condition on Admission.—Frequency every three or four hours by day, twice at night. Stream good but often interrupted, some urgency, no incontinence. No hæmaturia. Urine: Turbid, offensive, alkaline, sp. gr. 1018, albumin present, urea 1·3 per cent., much ropy muco-pus. Bladder intolerant, cystoscopy impossible. Cystogram: Bismuth suspension. Diverticulum size of a hen's egg on right side of bladder. Long narrow neck.

Operation.—On the 16th. Trendelenburg position. Old scar excised, peritoneum opened. With the help of a finger in the peritoneal cavity the peritoneum was stripped off the bladder. Opening in peritoneum sutured and bladder opened. A loose stone was removed. Diverticulum found to be packed with calculi, which were removed. It was about the size of a hen's egg, and extended downwards to base of bladder. The ureter curved downwards and forwards, first behind and then below the orifice of communication. The diverticulum was very adherent but was freed and removed from outside the bladder. Gap in bladder wall closed with two layers of continuous sutures. Pre-vesical space and bladder drained, rest of wound sutured. The orifice of the diverticulum just admitted the index finger. It was about half an inch above and to the outer side of the right ureter.

Course of Case.—Convalescence uneventful. Patient discharged on May 26th. Wound soundly healed. No frequency of micturition. Urine still turbid. No residual urine.

CASE 6.—Male, aged 72, admitted to St. Peter's Hospital Sept. 1st, 1915.

History.—Frequency of micturition and straining for three years. Prostatectomy January, 1914. Was treated for cystitis March and April, 1914. His condition improved for a few weeks, then grew steadily worse.

Condition on Admission.—Frequency every ten minutes by day, every 45 minutes by night. Stream dribbling, great straining. Occasionally passed clots. Severe pain along the urethra during micturition. Urine: Turbid, ammoniacal, urea 1·4 per cent., much muco-pus, albumin present. Cystogram: Bismuth suspension. Bilateral diverticuli, each about the size of a walnut, standing well out from the bladder.

Operation.—On the 3rd. Trendelenburg position. Old scar excised. Bladder very adherent to surrounding structures, especially to the posterior surface of the pubis. Adhesions divided and bladder opened. The orifices of the diverticula were symmetrically placed, each about an inch above and to the outer side of the corresponding ureter. Bladder wall split down to the orifices and the diverticula dissected free and removed. Bladder wound closed round a large tube and each lateral space drained. The whole operation was rendered difficult and tedious on account of adhesions.

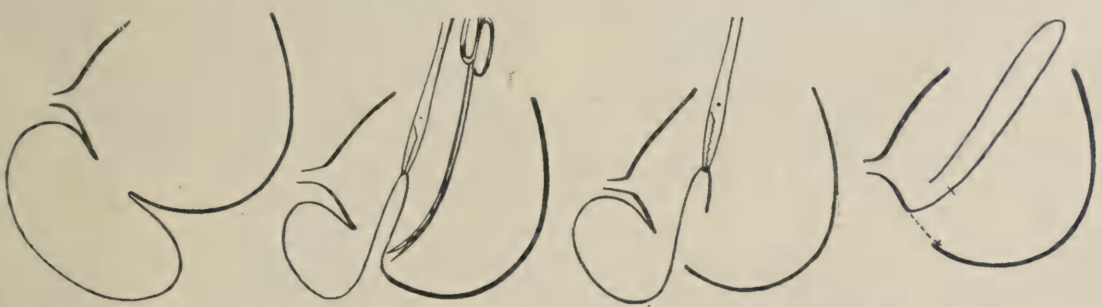


FIG. 4.—Stages of the operation for invagination of the diverticulum in Case 8. The dotted line in the last diagram indicates the flap of substance of the sac left in place and stitched over the defect in the bladder.

Course of Case.—Patient discharged from hospital on the 29th. Wound firmly healed, frequency two hours by day and night. Attended the out-patient department for a few months, during which time his urine became clear and he lost his frequency of micturition.

CASE 7.—Male, aged 49, admitted to St. Peter's Hospital June 20th, 1915.

Condition on Admission.—Frequency of micturition eight to ten times during the day, twice at night. Pain along the urethra during the act. No stricture, no enlargement of the prostate. Urine: Bacilluria, no albumin or sugar, urea 1·1 per cent. Residual urine 9 oz. Cystoscopy: Base of bladder and all round the internal meatus œdematous. Opening of a diverticulum just above and to the inner side of the right ureter. Ureteric orifices normal in appearance.

Operation.—On the 23rd. Trendelenburg position. Bladder widely opened. Diverticulum admitted index finger to a depth of almost 3 inches. Incision round orifice and diverticulum freed by blunt dissection. A ½-inch tube passed through the bladder and into the space from which the diverticulum had been removed. Gap in bladder sutured round it. Bladder drained.

Patient discharged August 4th. Wound healed, no residual urine, no frequency.

CASE 8.—Male, aged 71, admitted to St. Peter's Hospital August 23rd, 1919.

History.—Fifteen years before had some difficulty in passing urine for three or four days. Well until April, 1919, when sudden retention of urine occurred, followed by a severe fit of shivering. Catheterised. Since then on complete catheter life, passing the instrument three or four times a day and once at night. Previous to April, 1919, frequency every two hours by day and every hour by night.

Condition on Admission.—Decidedly senile. Per rectum, prostate not enlarged. Cystoscopy. Slight intravesical projection of prostate. In the neighbourhood of right ureter, round orifice of an enormous diverticulum. Orifice about the size of a shilling, cavity very dirty. Right ureter could not be seen, left normal in position. Severe general cystitis. Cystogram: Thorium solution. Oblique position showed a double cavity, with the diverticulum low down in the right side of the pelvis. It was about the same size as the bladder. Antero-posterior position, showed cavity overlapping bladder, and extending far to the right. Urine: Sp. gr. 1010, acid, albumin and sugar present, urea 0·3 per cent., 183 gr. passed in the 24 hours.

Operation.—On Sept., 5th. Stovaine. Trendelenburg position. Median incision from pubis to umbilicus, bladder widely opened. With the hand in the bladder, the finger could just reach to the bottom of the sac. An attempt was made to invaginate the diverticulum into the bladder, by blunt dissection from without, aided by traction by means of a volsellum passed through the orifice. Dense adhesions binding the sac to the seminal vesicles, prostate, and rectum made it impossible to complete this invagination; however, the upper wall of the diverticulum was completely invaginated. A semicircular incision was then made, severing the upper portion of the neck of the sac (Fig. 4), and the diverticulum was inverted through this opening. This made it possible to reach its outer wall, and the surrounding tissues were then easily separated off by means of gauze dissection. The whole of the diverticulum was by this means turned inside out, and invaginated into the bladder. It was so large that more than half of it came through the abdominal wound. As the vesical orifice of the right ureter had never been identified, the ureter itself was exposed in the pelvis and opened. A catheter was passed down it, and appeared between two folds of mucous membrane, just within the diverticulum, opposite the lowest point of the opening. The sac was then cut away, except for a small semicircular flap surrounding the ureteric orifice. This flap was stitched over the defect in the bladder. The ureter was sutured, and the bladder wound closed round a large tube. The lateral vesical space was drained, and the abdominal wound closed round the tubes.

Course of Case.—The patient bore the operation well, but convalescence was slow. The suprapubic sinus closed after a catheter had been tied in for a fortnight. Patient sent to a convalescent home on Oct. 25th. Wound healed, but patient entirely dependent on his catheter.

Condition on Readmission.—April 10th, 1920. On catheter life since operation. Prostate: lateral lobes slightly enlarged, smooth, and movable. Cystoscopy: Shallow depression at sight of diverticular orifice. Small intravesical pro ection of middle lobe of prostate. Severe chronic cystitis. Urine: Sp. gr. 1020, acid, small quantity of albumin, moderate quantity of sugar, cloudy yellow colour, deposit of mucus. Phenolsulphonephthalein (intravenous injection) appeared in three minutes; 44 per cent. excreted in the first half-hour, and 11 per cent. in the second. Urea-concentration test: 1·9 per cent. in the second hour, and 1·7 per cent. in the third.

Operation.—Prostatectomy, on the 23rd. Stovaine. Bladder opened after it had been freed from the pubis. Peritoneum pushed upwards from the scar. Small prostate easily enucleated. Very little bleeding.

Course of Case.—Patient discharged on May 18th. Wound healed. Frequency two hours by day, twice at night. Residual urine one ounce. Urine turbid. He attended the out-patient department for a few months. General condition improved very much. Frequency normal. I heard from this patient on March 20th, 1923, as follows: General health good; no retention; frequency four hours by day, three times at night; stream good, urine clear; no pain or leakage through scar.

CASE 9.—Male, aged 50, admitted to St. Peter's Hospital Dec. 28th, 1920.

History.—Difficulty in micturition for 12 months, which was steadily getting worse. Frequency every hour by day, not at all during the night. Had cystotomy done one month before for over-distension, told he had a large pouch in his bladder.

Condition on Admission.—Suprapubic sinus through which all the urine came. Urine very foul, sinus surrounded by unhealthy granulations. Prostate slightly enlarged, hard nodule right lobe, whole gland movable.

Operations.—Cystotomy on the 31st. Sinus enlarged, opening of a large diverticulum found just outside right ureter. Bladder very foul, almost pure pus coming from diverticulum. Tube inserted into sac, and another into bladder. Daily irrigations. Excision of diverticulum, Jan. 14th, 1921. Stovaine and general anæsthesia. Trendelenburg position. Bladder widely opened, and freed from adhesions. Contents of diverticulum still very foul. Diverticulum freed from surrounding structures, invaginated into bladder, and removed. Operation very difficult on account of dense adhesions. Gap in bladder sutured. Suprapubic wound closed round large tube. Lateral vesical space drained.

Course of Case.—Patient discharged on March 13th. Slight suprapubic leak. Passing urine freely and without pain. On June 21st he was readmitted, with double pyelonephritis. Sinus enlarged, de Pezzer tube inserted. Patient sent to infirmary. (As I was out of town, I did not see this patient on his readmission.)

CASE 10.—Male, aged 51, admitted to St. Peter's Hospital June 26th, 1920.

History.—Frequency of micturition for two years, gradually getting worse. Difficulty in micturition for one year. Ten weeks before admission, complete retention. Metal catheter passed under general anæsthesia, but as it could not be passed a second time a perineal section and suprapubic cystotomy was performed. A diverticulum was then discovered. Bladder drained for ten weeks "in the hope that the diverticulum would contract." Venereal disease denied.

Condition on Admission.—Suprapubic and perineal fistulæ; most of the urine came through the former opening. Per rectum, prostate not enlarged. In the region of the left seminal vesicle a soft, elastic, sausage-shaped tumour was felt. It appeared to be adherent to the pelvis. Urine: Sp. gr. 1020, cloudy yellow, acid, albumin present, no sugar, deposit of pus. Urea concentration test, 1·65 per cent. in the second hour.

Operations.—(1) On July 2nd (stovaine), urethra easily dilated to 14/16, and 22 F. catheter tied in. Perineal wound allowed to heal. On the 23rd (2) cystotomy (stovaine and ether). Scar excised, and bladder opened. Diverticulum discovered on the left side. Opening about an inch above and to the outer side of left ureter. It easily admitted the index finger. Cavity very large, about the size of the clenched fist, was filled with exceedingly foul pus. Tube inserted into diverticulum and another into the bladder. Wound partially closed. Continuous irrigation was attempted, the fluid entering through the tube in the diverticulum and returning by the bladder tube, but it failed, as the diverticular orifice contracted round the tube placed in it and did not allow the fluid to circulate. (3) Excision of diverticulum on the 28th (stovaine, and ether after the first hour). Cystotomy wound reopened. Bladder wall very thick and indurated, which made it difficult to expose the interior of the viscus. Much peri-cystitis. Left lateral wall split down to the diverticular orifice. Sac very adherent, and was torn during removal, but the whole of it was got away. Peritoneum twice torn and sutured. Left ureter localised, and kept from injury. Left vas cut across. Bladder sutured round a large tube. Lateral space drained. Fowler position, Murphy's rectal drip.

Course of Case.—Patient discharged from hospital August 30th, 1920. General condition good. Wound soundly healed. Urine acid, slight deposit of pus. Could hold urine for two or three hours. Residual less than one ounce. On March 20th, 1923, I heard from this patient as follows: General health fair; frequency by day six times, once at night; urine clear, no pain, stream fair, no leakage through wound.

CASE 11.—Male, aged 53, admitted to St. Peter's Hospital March 4th, 1922.

History.—Since 1915 frequency of micturition, later difficulty and straining. Urgency and some incontinence for three years. For four months has catheterised himself every day, but was able to pass a small quantity of urine naturally.

Condition on Admission.—No stricture. Prostate slightly enlarged, soft, elastic, could be felt bimanually, freely moveable. Cystoscopy: Residual urine 9 oz. Very marked trabeculation. Numerous small saccules. Diverticulum on right side, at junction of posterior and lateral walls. Stone in post-prostatic pouch. Ureteric orifices not seen on account of intra-vesical projection of middle lobe of prostate. No cystitis. Urine, clear, acid, sp. gr. 1017, no albumin or sugar, daily urea 1·8 per cent., urea concentration test 3 per cent. Cystogram: Sodium iodide solution. Large diverticulum right side, long narrow neck. Numerous small saccules, especially near the base of the bladder.

Operation.—On the 15th. Suprapubic incision. Calculus removed. Bladder wall very thick, much peri-cystitis. Bladder wall split down to orifice of diverticulum, and sac excised. Right ureter and vas adherent to it. Prostate enucleated, and prostatic cavity packed with gauze. Wound in bladder sutured round a half-inch tube. Small tube in lateral space. Wound closed.

Course of Case.—On April 15th patient discharged from hospital. General condition excellent. Suprapubic wound healed, passing water freely per urethram. This patient was seen on Feb. 26th, 1923. Frequency four hours by day, occasionally once at night. Residual urine 1½ oz. Urine slightly cloudy. General condition very good.

CASE 12.—Male, aged 37, admitted to St. Peter's Hospital April 1st, 1922.

History.—Eighteen months before, pain in the hypogastrium, which had no relation to micturition. Six months later frequency and difficulty in micturition. Frequency then seven or eight times by day, twice or three times by night. Stream poor, only a small dribble, urgency. April, 1921, acute retention, lasted two days. Similar attack next month. July, 1921, suprapubic cystotomy for stone, but none found. Since then had passed a catheter once or twice a day on himself.

Condition on Admission.—Weak suprapubic scar, which broke down from time to time, and leaked urine. Bladder easily palpable when distended. Catheter life. Prostate normal. Cystoscopy: Distension 22 oz. Chronic cystitis, especially in region of trigone. No trabeculation. Two diverticula: (1) just above and to the outer side of the left ureter, contents turbid, orifice about the size of a lead pencil; (2) small one just above right ureter. Trigone displaced to right so that the left ureter lay almost in the middle line. Both orifices normal. Œdematous mucous membrane round orifice of large diverticulum. Both ureters catheterised. Clear urine from both kidneys. Urea concentration test, both kidneys gave 3·0 per cent. concentration. Same test applied to bladder urine gave 1·42 per cent. Internal urethral orifice normal. Cystogram: Sodium iodide solution. Twenty ounces of fluid injected. Bladder displaced to the right. Very large diverticulum filling up left half of true pelvis (Fig. 5). Bladder emptied as much as possible by catheter, and second exposure made. Diverticulum still distended, and a small amount of fluid in the bladder itself. (Fig. 6.) Urine: Turbid, alkaline, no albumin or sugar, daily urea 1·8 per cent. in 50 oz., or 306 gr.

Operation.—On the 19th. Left ureter catheterised. Trendelenburg position. Scar excised, bladder freed from pubis and opened. Diverticulum freed by blunt dissection, and gradually invaginated into bladder. Left ureter lay behind and below neck of sac, and was separated off. Diverticulum together with a small portion of bladder wall surrounding neck removed. Gap in bladder sutured. Lateral space drained, large de Pezzer tube in bladder. Wound closed. Diverticulum on right side too small to admit tip of finger, not removed.

Course of Case.—On May 8th patient discharged from hospital. Wound healed. Micturition normal. Frequency three hours by day, once at night. Residual urine 1½ oz.

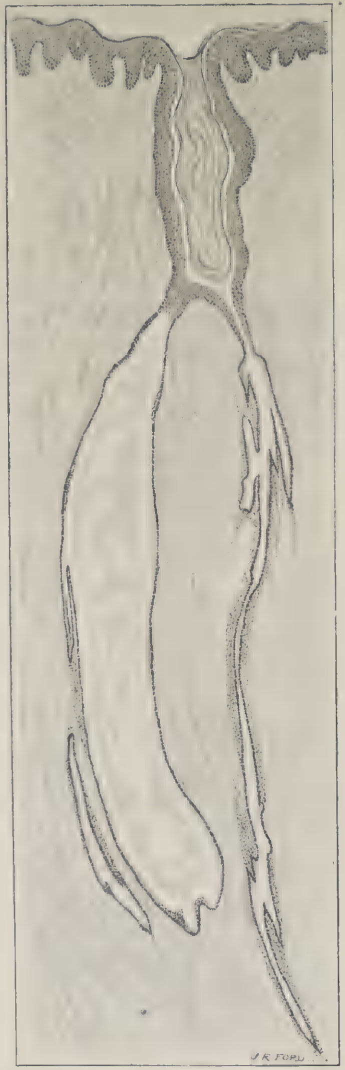


FIG. 1.—Longitudinal section of a duct mouth into which two collecting ducts open, one being distended with secretion. The epithelial plug is shown in relation to the squamous-celled lining of the mouth. (× 20.)

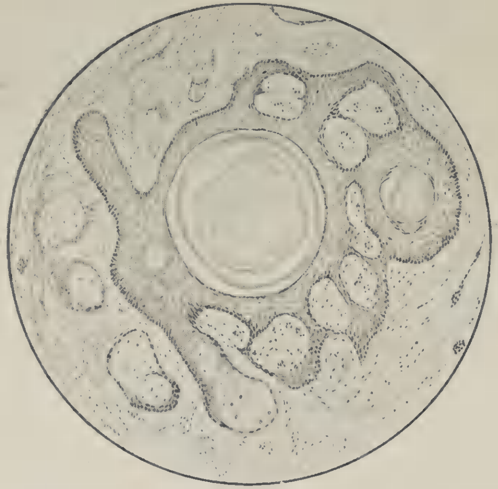


FIG. 2.—Transverse section (paraffin) of mouth of a duct, showing laminated epithelial plug in position

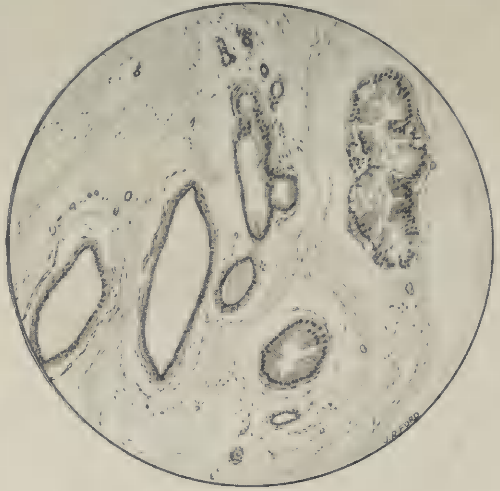


FIG. 3.—A group of ducts and acini, with swelling of epithelial cells in some and distension of others.

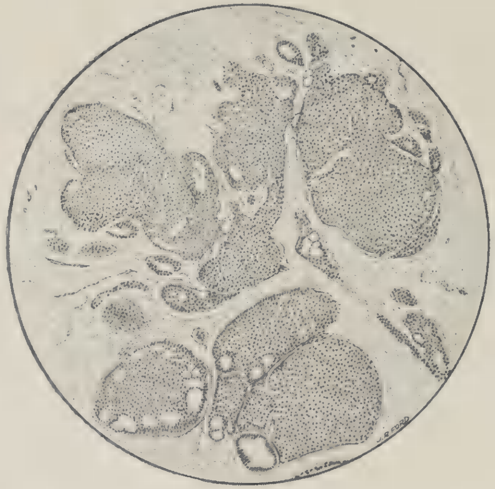


FIG. 4.—Massive epithelial proliferation in an advanced stage. A few acini can still be seen.

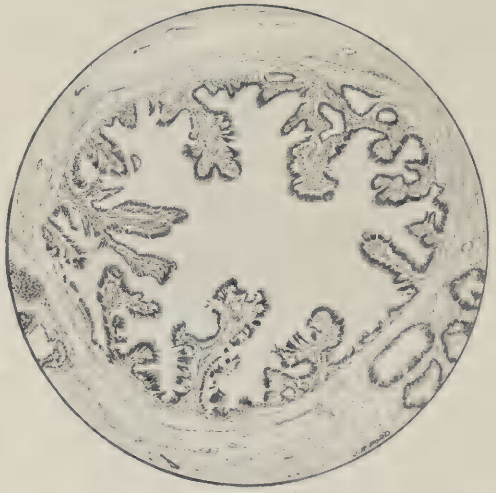


FIG. 5.—First stage of formation of papillomata in a duct. The epithelial cells are swollen.

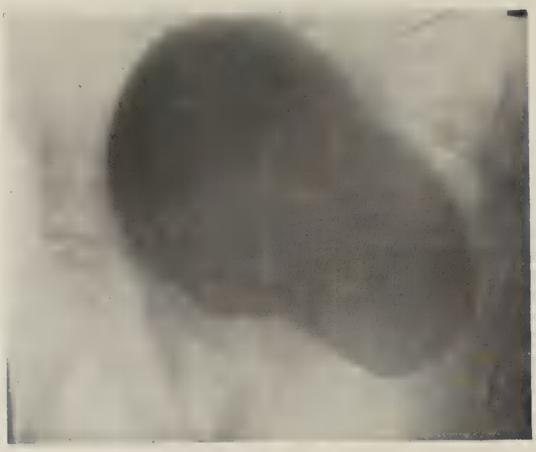


Fig. 5.—Cystogram of Case 12 (sodium iodide solution) showing very large diverticulum filling up left half of true pelvis.

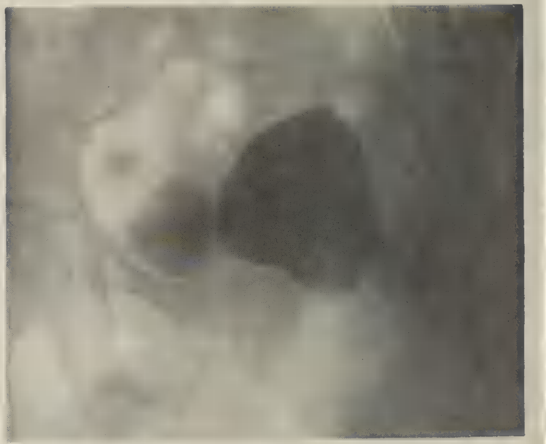


Fig. 6.—Second cystogram of Case 12 taken after bladder had been emptied as much as possible by means of a catheter. Diverticulum still distended with the sodium iodide solution, a small quantity of which also remained in the bladder.

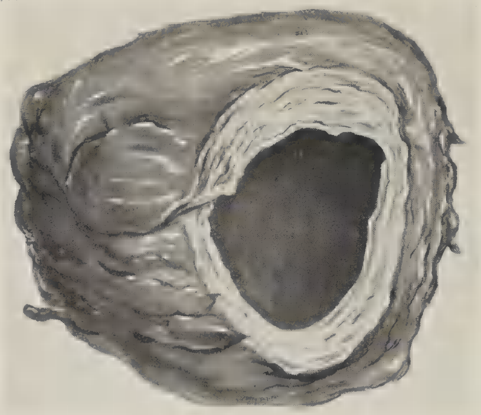


Fig. 7.—Diverticulum removed from Case 1.

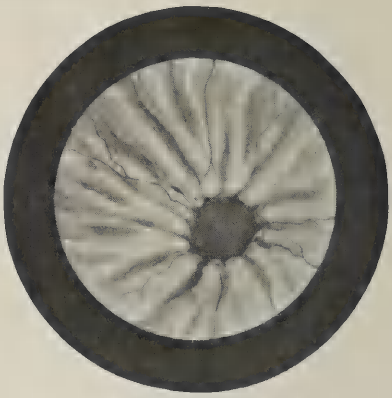


Fig. 8.—Typical appearance of a diverticular orifice as seen through the cystoscope.

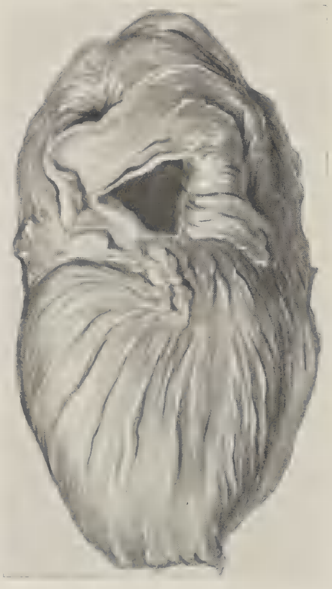
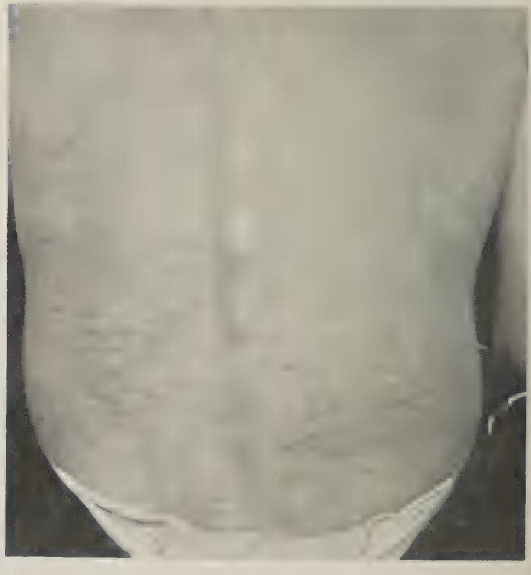


Fig. 9.—Diverticulum removed from Case 13.

DR. BEDO HOBBS: STRIÆ DISTENSÆ.



Case 3, showing the striæ scattered all over the lower thoracic and lumbar regions.

On March 20th, 1923, I heard from this patient as follows: General health steadily improving since operation; frequency three or four times by day, twice by night; stream "splendid"; no pain; wound soundly healed.

CASE 13.—Male, aged 62, admitted to St. Peter's Hospital Jan. 5th, 1923.

History.—Ten years ago hæmaturia after straining at stool. Since then pain "in the bladder" whenever he has a cold, and occasionally a trace of blood in the urine. Five years later frequency and difficulty in micturition. Soon afterwards catheter life, passing the instrument twice or three times a day. Cystoscoped in 1912, and told "he had a sac." Admitted to St. Peter's Hospital Oct. 20th, 1919. Prostate removed; discharged Nov. 27th. Had intense cystitis at the time, and diverticulum apparently not noticed on cystoscopy. Suprapubic wound took 22 months to heal. Patient washed his bladder out every day with nitrate of silver by Janet's method. Had slight hæmaturia shortly after leaving hospital, and passed several small stones.

Condition on Admission.—Frequency of micturition, six times by day and twice by night. Micturition normal, stream and projection both good. Abdomen: Suprapubic scar, weak in its lower portion. When bladder was distended, it could be felt in right iliac fossa. Right kidney not palpable, left completely palpable, movable, enlarged, painless. Cystoscopy: Residual urine 30 oz. Bladder capacity 50 oz. Generalised cystitis with irregular bulging and sacculation. Right ureteric orifice active, fairly healthy, left large, patent, never closes. Opening of diverticulum fairly high up on the left side, difficult to see because left wall of bladder was pushed almost to middle line by the diverticulum. It appeared to be about the size of a sixpenny piece. Cystogram: Sodium iodide, 5 per cent. solution; 48 oz. injected. Enormous bladder pushed over into right iliac fossa. Diverticulum filled left side of true pelvis. Small slit-like space between bladder and diverticulum. Narrow orifice of communication. When bladder had been emptied as much as possible by means of a catheter, diverticulum remained nearly full, and there was still some fluid in the bladder itself. Urine: Hazy, sp. gr. 1012, alkaline, no albumin or sugar, daily urea 1·0 per cent. in 75 oz., or 322 gr. Urea-concentration test 1·5 per cent. in 3·5 oz., or 22 gr.

Operation.—On the 10th. Old scar excised and bladder opened. Trendelenburg position. Orifice of diverticulum about three-quarters of an inch in diameter, situated about an inch above and to outer side of left ureter. Catheter passed up left ureter. Diverticulum freed by finger and gauze dissection, and removed from outside the bladder. Gap in wall sutured by two layers of continuous catgut sutures. Internal urethral orifice about the size of a lead pencil, but was incised, as there was a "shelf" above prostatic cavity. Marion's tube in bladder, lateral space drained. Wound closed, catheter tied in. Fig. 9 (on Plate) shows the diverticulum after removal.

Course of Case.—Patient discharged from hospital Feb. 19th. Wound firmly healed. Micturition normal, no frequency. Residual urine ½ oz. I saw this patient on March 12th, 1923. General condition excellent. Micturition normal. Frequency four hours by day, once at night. Urine clear, a few small flakes in it.

CASE 14.—Male, aged 69, admitted to St. Peter's Hospital Jan. 7th, 1923.

History.—Three years ago difficulty in starting micturition. A few months later pain at tip of penis before and during act. Nocturnal frequency for 18 months. Complete retention two years ago.

Condition on Admission.—Bladder distended to umbilicus. Micturition, much straining, delay, and pain. Stream in drops only, some after-dribbling. Prostate only slightly enlarged, rather firm. No stricture. Put on regular catheterisation, 18 oz. being drawn off each time the instrument was passed. Urine: Turbid, alkaline, sp. gr. 1022, no albumin or sugar, much pus, daily urea 2·5 per cent. in 30 oz., or 327 gr. No cystoscopy when in hospital on account of over-distension.

Operations.—On the 10th, suprapubic cystotomy. Trivial intra-vesical projection of prostate. Diverticulum size of a hen's egg, above and to the outer side of left ureteric orifice. De Pezzer tube inserted. On the 24th, diverticulum excised from outside bladder. It was very adherent. Gap in bladder wall sutured with two layers of continuous catgut. Some thick peri-vesical fat sutured over opening. Prostate size of a cherry enucleated. It was fibrous, and contained several small calculi. Cavity packed. Marion's tube in bladder. No tube in lateral space.

Course of Case.—Sharp attack of secondary hæmorrhage on fourth day. Feb. 5th, large abscess left side of bladder. Tube inserted. Since then did well. On March 7th he passed urine naturally, but fistula not quite closed. On the 20th, still in hospital.

The Relative Values of the Different Operative Methods.

It is universally admitted that the only satisfactory treatment of this condition is excision of the sac, but there is a considerable divergence of opinion as to the best method of performing the operation. Before discussing this question, however, I wish to point out the dangers of a preliminary cystotomy in these cases. A cystotomy does not drain the diverticulum. When the bladder contracts round the cystotomy tube, the diverticular orifice closes, and the cavity is completely shut off from the bladder. Under these conditions no amount of vesical irrigations will disinfect the diverticulum, and its contents invariably suppurate. The deplorable condition that patients Nos. 9 and 10 were in when I first saw them was undoubtedly due to this cause. In both cases I tried to control the suppuration within the diverticulum by passing a tube into the sac through its vesical orifice, but in neither case was it possible to wash out the sac into the bladder, or the bladder into the sac. Each cavity could be washed out independently of the other, but this was not satisfactory, and in both cases I was forced to operate while the sac was still in a filthy condition. The walls of these sacs have practically no power of contraction, and remain in an inert flaccid condition, which predisposes them to stagnation and infection. When I am called upon in future to deal with such grossly infected diverticula I shall, as a preliminary to excision, open the bladder, and pass two small tubes into the sac, as well as leaving a larger one in the bladder itself. Continuous irrigation can then be carried out, the fluid entering the diverticulum by one small tube, and leaving it by the other. It is in many cases possible to drain the diverticulum independently of the bladder, but I see no advantage in this procedure. If the diverticulum lies below and behind the bladder, it can only be satisfactorily reached from the perineum, and this perineal drainage may render subsequent removal of the sac exceedingly difficult, if not impossible. I consider that a preliminary cystotomy should not be done, except when the kidneys are damaged so severely that it is obvious that the patient would not stand a primary excision. Even in these cases the bladder should only be drained for as short a time as possible, and means must be taken to drain and irrigate the diverticulum independently of the bladder.

Turning to the operation of excision, I feel that no set operation is suitable for all cases, but I think there are certain broad indications which would lead the surgeon to choose beforehand the operation best suited to the particular case. I also feel that it is not always possible to make a definite plan of campaign until the bladder has been exposed, as so much depends on the amount of peri-cystitis present, and on the number and density of the adhesions binding the diverticulum to neighbouring structures. One can learn the size and position of the orifice, the amount of trabeculation of the bladder wall, and the severity of the infection by means of cystoscopy; and the size, position, and to a certain extent the relationship of the diverticulum by means of cystograms; but one has no means of telling beforehand whether the sac is bound down by adhesions, or lying free in the fatty tissue of the pelvis. With regard to the operation itself, diverticula may be excised: (1) from the outer surface of the bladder; (2) by splitting the bladder wall down to the orifice of the diverticulum; and (3) from within the bladder.

(1) *Excision from Without the Bladder.*—This operation is best suited for diverticula situated high up on the lateral walls of the bladder, and for those occurring at the urachus. The operation may be either trans- or extra-peritoneal. A trans-peritoneal operation is indicated if the orifice of the diverticulum lies above the line of reflection of the peritoneum from the bladder wall, but these cases are not common, as the orifice is usually situated well below this level. In some cases it is a help to open the peritoneum when stripping it from the upper wall of the diverticulum,

but if this is done the bladder should not be opened until the abdominal cavity has again been closed. I have performed this operation on five of my cases (Nos. 1, 3, 5, 13, 14); in two of them (Nos. 3 and 5) I opened the peritoneum to facilitate stripping it back from the wall of the sac. The operation is facilitated if the bladder is opened and one finger placed in the diverticulum, while the upper and outer walls of the sac are cleared by gauze dissection. When the operator is dealing with the lower portion of the diverticulum, the finger in the sac is of no further assistance. The wall of the diverticulum is then grasped low down by means of a volsellum, and aided by traction on it the dissection is completed. I have not found it any advantage to plug the sac with gauze, and if the diverticulum lies low down in the pelvis, it is a positive disadvantage. The plug fills up almost the whole of the narrow space one has to work in, and renders the dissection much more difficult. I have tried this method on several occasions, and always had to remove the gauze again in a few minutes. This operation is rendered difficult if the bladder walls are thick and indurated, if the diverticulum is also thick-walled, and if there is much peri-cystitis.

(2) *Splitting the Bladder Wall down to the Orifice of the Diverticulum.*—This operation was first described by me in a paper read before the Urological Section of the Seventeenth International Congress of Medicine, which met in August, 1913,[2] and quite independently by Marion in November of the same year.[3] In my case, however, the operation was trans-peritoneal, while in Marion's it was extra-peritoneal. The idea underlying both these operations was the same, and was an attempt to obtain better exposure of the deeper parts of the diverticulum. I performed this operation in Case 2 (trans-peritoneally), and in Cases 6, 10, and 11 (extra-peritoneally). Case 6 was one of bilateral diverticula, and both sides of the bladder were split down to the necks of the diverticula. The incision is really a racquet, with a long handle and a small blade, as the orifice of the diverticulum is encircled, and a small portion of the bladder wall removed with the sac. The operation is indicated: (1) in cases where the diverticulum is situated low down on the posterior wall of the bladder; (2) when the walls of the bladder or diverticulum are thick and inelastic; and (3) when there is marked peri-cystitis. Case 2 came under the first category, and I do not think I could have removed this diverticulum by any other means. In Cases 6, 10, and 11 troublesome adhesions were present, due in the first case to a previous prostatectomy, in the second to a prolonged suprapubic and perineal drainage, and in the third to marked peri-cystitis. In Cases 6 and 11 the bladder walls were very thick. A rough estimate of the thickness of the bladder wall can sometimes be obtained by means of a simple cystogram. In every case of vesical diverticulum I have seen the walls of the bladder and of the diverticulum are in contact with each other round the diverticular opening. This means that the length of the neck of the diverticulum is equal to the combined thickness of these two walls, so that if the diverticular shadow lies at a considerable distance from that thrown by the bladder, and the two are only connected by a long isthmus, it is fairly safe to assume that the bladder walls are thick. I may also add that the walls of the bladder are always thicker than those of the diverticulum.

(3) *Intra-Vesical Operations.*—(*a*) Encircling the orifice by an incision through the whole thickness of the bladder wall, and removing the diverticulum by blunt dissection. I have only performed this operation once (Case 7), and have completely given it up, as I consider it dangerous. It is only suited for small diverticula, and is dangerous, as there is a great risk of wounding the ureter, which always lies in close relationship with the neck of the diverticulum.

(*b*) Invagination of the sac. This operation should be performed partly from inside the bladder and partly from outside it. It is a dangerous procedure to insert a volsellum through the diverticular opening, seize the fundus of the sac, and attempt to invaginate it. One operator drew a loop of small intestine into the bladder by this method, but fortunately discovered his mistake before dividing the neck of the sac. If it is decided to remove a diverticulum by this method, the upper wall of the sac should first be cleared as far as possible from the outer side of the bladder, and also from the surrounding structures. This portion of the diverticulum should then be invaginated through the orifice and seized from within. The dissection can then be completed from without, while traction is made by means of a volsellum gripping the portion already invaginated. This operation is only suitable for thin-walled diverticula that are comparatively free from adhesions. Young employs suction to invaginate the diverticulum.[4] This method requires an electric pump, as the suction obtained by means of a Sprengel's pump is quite insufficient for the purpose. I have performed the operation of invagination in three cases (Nos. 4, 9, and 12); I attempted it in Case 13, but was unable to complete the invagination, so I turned the sac back and removed it from outside the bladder.

(*c*) Combined invagination and inversion of the sac. This operation has been fully explained when describing Case 8, so I need not recapitulate it. I believe this method has not been described before, and I consider it a definite advance on the usual invagination method. As a matter of fact, I failed to invaginate the sac in this case, and I think I should have been unable to remove the diverticulum if I had not thought of inverting it. It can be employed in diverticula springing from any part of the bladder, but is particularly useful for dealing with large sacs situated deep down in the pelvis. It is eminently safe, as the outer surface of the diverticulum is well seen while the adhesions are being separated from it. It cannot, of course, be employed in cases where the wall of the sac is too stiff to allow of invagination, but this is the only definite contra-indication.

Operative Treatment in Cases Complicated by Enlarged Prostate.

Cases of vesical diverticula have frequently been diagnosed as enlargement of the prostate, and the gland has been removed before the presence of the diverticulum was suspected. This happened in Cases 6 and 13 of my series. I feel that in both these cases the patient's condition was rendered worse by this procedure. I have already alluded to the bad results obtained in cases where the bladder has been simply drained, and everything I have said regarding cystotomy applies with equal force to prostatectomy. I feel that the ideal procedure is to remove both the diverticulum and the prostate at the same sitting. This was done in Cases 4, 11, and 14 with excellent results. If, however, it puts too great a strain on the patient's powers of recuperation, the diverticulum should be removed at the first sitting, and the prostate enucleated as soon afterwards as is feasible. This course was followed in Case 8. Lastly, if the patient's condition is so poor that he will not stand any major operation, the bladder should be opened and independent drainage provided for the diverticulum in the manner already described. Even under these circumstances the preliminary drainage should be of as short a duration as possible.

Vesical Diverticula Complicated by Stone.

(1) *Calculus Lying Free in the Bladder.*—The mere removal of such a stone is never a complete operation. There may be others in the diverticulum. Even if there are none the diverticulum remains, and will probably give rise to symptoms. I do not think that a litholapaxy should ever be performed where there is a definite diverticulum. A case on which I operated some years ago illustrates this point. The patient had a stone about the size of a filbert lying free in his bladder, and on cystoscopy a small shallow diverticulum was seen just to the outer side of the right ureter. I thought it was too small to give rise to any symptoms, and so decided to crush the stone. It was

caught with the lithotrite, but when I commenced to crush it, it slipped out of the jaws of the instrument and I could not find it again. I then cystoscoped the patient and found the stone in the diverticulum. The bladder was opened and the stone removed from the sac, which was just large enough to hold it comfortably. The orifice of the diverticulum was then enlarged downwards and the wound closed. What happened to the whole calculus in this case may easily happen to fragments in others, and I feel sure this is one of the causes of recurrence in these cases. Case 5 also bears out this point. He underwent a suprapubic lithotomy and two litholapaxies in the space of about a year, yet when I operated there was a stone lying free in his bladder, and the diverticulum was packed full of them. I feel strongly that the correct procedure in all these cases is to open the bladder, remove the calculus, and excise the diverticulum.

(2) *Stone in the Diverticulum.*—Here the indications for removing the diverticulum are even stronger. Mere removal of the calculus may make the patient's condition worse, just as a simple cystotomy does. A very interesting case illustrating this point has been described by Kummer and Brutsch.[5] Their patient suffered from the usual symptoms of stone for over 20 years. He never had retention, and there was only a small quantity of residual urine. A stone was felt in his bladder, and the diagnosis confirmed by radiography, which showed a shadow filling up the greater part of the true pelvis. The bladder was opened and two calculi were found lying free in it, while a third was seen projecting from the orifice of a very large diverticulum, which it filled completely. They were all removed, but the diverticulum was left in situ. After the operation the patient was absolutely unable to pass urine naturally, and had to rely on self-catheterisation. The authors came to the conclusion that his retention was not due to atony of the bladder, but to the presence of the diverticulum. They advised an operation for its removal, but the patient refused it. If possible the diverticulum and the stone in it should be removed at the same sitting, but if the patient's condition will not stand this operation, one must remove the stone first. In this case the diverticulum must be drained independently, and the operation for its removal performed as soon as possible after the lithotomy.

Relationship between Ureter and Diverticulum.

It is important for the operator to bear in mind the close relationship between the ureter and the neck of the diverticulum. In the first place, the orifices of the "lateral group" of diverticula are always found in a limited oval area of the bladder wall, which lies above and to the outer side of the corresponding ureteric orifice. Occasionally the ureter opens into the diverticulum itself, in which case its orifice lies just within the lower and internal quadrant of the mouth of the sac. Outside the bladder the relationship is even more intimate. If the ureter is traced upwards from the point where it enters the bladder wall, it will be found to lie at first immediately below the lowest point of the neck of the sac. It then passes backwards and upwards behind it. This means that it follows the curve of the lower and posterior quadrant of the opening. If the ureter is traced still further upwards, it will be found to lie either in the cleft between the bladder and diverticulum, or to occupy a deep groove in the posterior wall of the latter. If the diverticulum stands well away from the bladder, the ureter lies between the two, but if it is in close contact with the bladder wall, and especially if it lies partly behind the bladder, the ureter occupies a deep sulcus in its posterior wall. In either case the ureter is compressed or displaced by the drag of the sac, and dilatation of its upper part and of the corresponding renal pelvis has frequently been observed. In eight of my cases the ureter was exposed during operation, and on each occasion it was found either to be dilated or thickened. If the ureter opens into the diverticulum itself it usually tunnels through the lower and posterior quadrant of the neck. This is simply an exaggeration of the usual relationship. The proximity of the ureter to the diverticular orifice must be borne in mind whenever the condition is treated by splitting down the partition between the sac and the bladder. Such an incision should not be made directly towards the internal meatus, but should be curved forwards a sufficient distance to avoid any chance of injury to the ureter.

Residual Urine.

Perhaps one of the most remarkable phenomena connected with vesical diverticula is the large amount of urinary obstruction they cause. In fact, obstruction and infection are the most usual indications for operation. The amount of residual urine is usually measured by passing a cathether immediately after the patient has emptied his bladder as completely as possible by micturition, but in some cases, especially if the diverticulum is large, it is impossible to drain off all the urine by this means. The amount left behind is often considerable, and may for convenience be called the "concealed residual." I first suspected the presence of this concealed residual in Case 2. At the operation the bladder was washed out and emptied as completely as possible, and then filled with air, yet when it was opened the diverticulum was full of lotion. The presence of this concealed residual was also demonstrated by means of the cystograms taken in Cases 12 and 13. In both these cases the first cystogram was taken when the bladder was filled to repletion. (Fig. 5 on Plate.) It was then emptied as completely as possible by means of a catheter and the second exposure made. In both cases the diverticulum remained full, and in addition there was a distinct shadow due to the presence of a certain amount of opaque fluid in the bladder itself. (Fig. 6 on Plate.) Although it is easy to demonstrate the presence of this concealed residual I do not know of any means of accurately estimating its amount. This concealed residual is of great practical importance as it renders all attempts to estimate the functional cativity of the kidneys, by means of tests applied to the bladder urine, fallacious. This applies both to the elimination of dyes and to the urea-concentration test, and if these methods are made use of the urine should be obtained directly from the kidneys by means of ureteric catheterisation. For example, in Case 12 the urea-concentration test carried out on bladder urine gave only 1·4 per cent., while the same test carried out on urine obtained by catheterisation of both ureters gave 3 per cent. of urea from each kidney. The latter was the true estimation of the renal function; in the first case the urine was diluted with lotion which could not be evacuated from the bladder by means of the catheter. If it is impossible to catheterise the ureters, one must depend on an estimation of the blood-urea.

Diagnosis.

In the majority of cases the diagnosis of the presence of a diverticulum is made by means of the cystoscope. The appearance of the orifice of a large sac is so characteristic that it is impossible not to recognise it at a glance. (Fig. 8 on Plate.) Occasionally, however, cystoscopy is rendered difficult on account of intense cystitis, or the orifice may be hidden by bullous œdema or a growth, or if the bladder has not been fully distended it may lie between two folds of mucous membrane. In these cases a cystogram should be made. The diagnosis of the size and relationship of the diverticulum can be made by means of cystograms, but to obtain the best results the technique must be carefully thought out. I now use a solution of sodium iodide which has been boiled and allowed to cool to the body temperature. The strength of the solution depends on the capacity of the bladder, which should be estimated beforehand. If it is less than 10 oz., I use a 15 per cent. solution, if it lies between 10 and 20 oz. a 10 per cent. solution is best, while if the capacity is more than 20 oz. a 5 per cent. solution is quite sufficient. If too strong a solution is used the shadow is so dense that it is difficult to distinguish between the shadow thrown by the diverticulum and that thrown by the bladder. In Fig. 5 (on Plate) a 30 per cent. solution was used, but the shadow was much too dense, and there was practically no differentiation between the bladder and diverticulum. As a general rule, the weakest opaque solution that will give a satisfactory shadow is the best one to use. When the patient is on the X-ray couch a catheter should be passed and the contents of the bladder evacuated as completely as possible. The opaque solution should then be run in, either by means of a syringe or by gravity, until the patient experiences a desire to micturate. A spigot is then placed in the catheter and a radiogram taken in the antero-posterior position. The patient is then rolled over on his side until the shadow of the diverticulum is distinct from that of the bladder. The best position is easily determined by means of the fluorescent screen. If the diverticular opening is in the posterior part of the bladder, as it nearly always is, the patient should be rolled to the opposite side. A second exposure should be made in this position. Lastly, without altering the patient's position, the spigot should be removed from the catheter and the bladder emptied as completely as possible. A third exposure should then be made. This is to ascertain if there is any concealed residual urine.

Conclusions.

(1) Excision of the sac is the only rational treatment of vesical diverticula.

(2) No single set operation is suitable for all cases.

(3) If the case is complicated by prostatic or urethral obstruction both conditions should be treated at the same sitting. When this course is not feasible it is better to remove the diverticulum first, and treat the obstruction at a later sitting.

(4) A preliminary cystotomy does more harm than good in most cases.

(5) The presence of a calculus either in the bladder or in the sac is an indication for excision of the diverticulum.

(6) As a rule the ureter lies in close relationship with the neck of the sac, and must be guarded from injury during operation.

(7) The contents of a diverticulum cannot always be evacuated by catheterisation. The urine left behind after catheterisation, often a considerable amount, I have termed the "concealed residual."

(8) The presence of concealed residual urine vitiates all tests of the renal efficiency which are carried out on bladder urine. To obtain an accurate estimate of the renal function it is necessary either to catheterise the ureters or to trust to an estimation of the blood-urea.

(9) The presence of a diverticulum is best diagnosed by means of the cystoscope, and its size and position ascertained by means of cystograms.

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Faculté de Médecine de Paris.—A post-graduate course in Dermatology and Venereal Diseases, under the direction of Prof. Jeanselme, will be held in the clinic of dermatology and syphilography, Hôpital Saint-Louis, and in the clinic amphitheatre (Salle Henri IV.) at 40, Rue Bichat, beginning on Oct. 5th (dermatology) and Nov. 14th (venereal diseases). Prof. Jeanselme will be assisted by Profs. Sebileau and Gougerot, and Drs. Hudelo, Milian, Ravaut, Lortat-Jacob, Louste, Lian, Darre, Tixier, De Jong, Sezary, Touraine, Coutela, Hautant, Lemaitre, Sabouraud, P. Chevalier, Burnier, M. Bloch, Hufnagel, Schulmann, Pomaret, Giraudeau, M. See, Bizard, Noire, Civatte, Ferrand, and Barbe. The fee for the course is Fr.150, and a certificate will be issued at its termination. Full particulars will be supplied on application to Dr. Burnier, Chef de Clinique à la Faculté, Pavillon Bazin, Hôpital Saint-Louis.

SOME OBSERVATIONS ON STRIÆ DISTENSÆ.

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(With Illustration on Special Plate.)

Striæ distensæ, which are also called striæ atrophicæ although there is no histological evidence of a true atrophic condition, have been reported at various times in medical literature. These cutaneous changes were first observed on the extremities by Ascherson [1] in 1835, and between 1856 and 1863 Reuss,[2] Röser,[3] and Förster[4] reported cases in association with typhus, typhlitis, and dysentery. Köbner[5] states that in 1867 Auerbach told him of a case of a 15-year-old boy with striæ on the thorax. This appears to be the first recorded case in this situation. Since then the striæ have also been noticed in other parts of the body and many and diverse views as to their origin have been adduced.

The condition is generally stated to be rather rare, and the figures of observers who have had the opportunity of examining a large number of cases certainly tend to confirm this. Thus Kaiser,[6] referring to typhus, says among 1932 patients suffering from this disease he found 25 with striæ over the patella. Again, Warnecke[7] found 12 patients with striæ distensæ on the thorax among 2000 male cases of pulmonary tuberculosis, while among 4000 women and girls with the same disease not a single case was observed. Kai Hammer[8] also found 12 cases—10 males and 2 females—among 5800 patients treated at Boserup Sanatorium. It is, however, probable that these changes are not so rare as is commonly supposed—the fact that their onset is insidious and painless probably accounting for the fact that they seldom attract attention. In the course of the last six months I have seen ten cases of striæ distensæ of the thorax associated with various diseases, and in considering these I hope to disprove some of the theories put forward regarding the causation of the condition, and confirm and amplify others, emphasising the point that they are neither a separate clinical entity nor in any way the manifestation of one disease, but are merely the result of the association of certain clinical conditions occurring in the course of many diseases.

Position and Appearance of Striæ.

Striæ distensæ have been reported in association with typhoid, typhus, colitis, scarlet fever, mumps, rheumatic fever, cerebro-spinal fever, pleurisy, pneumonia, pulmonary tuberculosis, intestinal tuberculosis, malignant disease of the pleura and peritoneum, septicæmia, and as a result of trauma. In addition to these I have also observed them in cases of infective endocarditis, nephritis, and in one patient with an abscess of the liver. Striæ may be found in the neighbourhood of the anterior axillary fold, over the breasts, abdomen, buttocks, thighs, and above the patellæ. There is some evidence that they may occur in these situations in quite healthy individuals, but when associated with disease the postero-lateral portion of the thorax, about the level of the eighth to twelfth dorsal vertebræ, appears to be the commonest situation. The skin changes may be unilateral or bilateral; in the latter case they are usually more marked on one or other side.

When they first occur the striæ are purplish in colour and appear as a series of irregular livid streaks, in which, in a few instances, small hæmorrhages are seen. The colour gradually changes to a dusky mauve and after some months fades altogether, taking on the pearly-white appearance of scar-tissue. The striæ are depressed below the level of the surrounding skin, as can easily be felt by running the finger across them, but some, in the later stages, of which Case 7 was an instance, take on a keloid appearance and are raised in the form of wheals. The lines are as a rule rather irregular in outline and vary from ½ in. to 8 in. in length with an average width of about ⅛ in., although in one of my cases a recently formed stria was ⅝ in. in width. On the back these lines are horizontal, while on the front of the abdomen they are vertical, tending to run obliquely outwards and downwards as they occur nearer the flanks. On the thighs and over the axillæ they are also more or less vertical, but are horizontal when found above the patellæ; that is, in all situations the long axis of the striæ is perpendicular to the direction in which the maximum tension which seems to have caused them is exerted. In the majority of cases the onset is insidious, and the striæ are not noticed by the patients until their attention is directed to them by the doctor or nurse.

Sir Dyce Duckworth[9] reported a case with striæ distensæ over the outer side of one thigh in which there was a marked degree of hyperæsthesia in the affected area. One of my patients, Case 7, also complained of soreness around some of the newly-formed striæ, but none of the other patients had noticed the presence of their striæ. Freund[10] and Craven Moore[11] have reported cases in which there was some blunting of sensation over the striæ, but in the vast majority of cases no sensory changes are found.

The striæ appear to occur only in young adults, the ages of my ten cases being within the narrow limits of 15 to 18 with one exception, who was aged 24. The age period of practically all the cases to which I have referred in the literature also lay between 12 and 22, 80 per cent. of these being between 15 and 20. One of Warnecke's patients was aged 49 but had been ill for 26 years, and there was no note as to when the striæ had first appeared. This restricted age-incidence alone ought surely to throw some light on the ætiology of striæ distensæ. There seems to be some difference of opinion regarding the sex-incidence. Cramer,[12] Warnecke,[7] and Hammer[8] have found a great preponderance among the male sex, while Schultz[13] and Riecke[14] report the reverse. In my ten cases the sexes are equally divided.

The following is a brief history, together with a short description of the striæ distensæ found in ten cases:—

CASE 1.—Female, aged 18, well nourished, with fairly advanced tuberculosis of both lungs of one year's duration. Confined to bed since May, 1922. Irregular evening rise of temperature throughout. Well-defined purple striæ distensæ in lower dorsal region on both sides—more marked on right. These were first noticed in January, 1923, but had probably been there some time. A few striæ actually over the vertebræ. Always lies on her back. Lost 12 lb. in last nine months.

CASE 2.—Female, aged 16, emaciated, with extensive tuberculous disease of left lung and early disease right side, three months' duration. Evening temperature of 101° to 102° F. A few recently formed striæ on postero-lateral portion of right side in lower dorsal region. Lies on right side.

CASE 3.—Male, aged 17, fairly well nourished, with extensive tuberculous disease of right lung, of 14 months' duration. Artificial pneumothorax induced on right side, July, 1922, followed two and a half months later by pleural effusion. Pyrexia during first few months, which later disappeared, except for an occasional rise. Well-defined striæ distensæ on both sides of back from ninth dorsal to first sacral vertebræ (see photograph). These appeared early in September before pleural effusion appeared. Usually lies on his back, occasionally on his right side. Gained 2 lb. in eight months.

CASE 4.—Male, aged 17, poor nutrition, rather toxic, and myoidema present. Tuberculous infiltration of both upper lobes and also larynx, six weeks' duration. Average evening temperature 99·6° F. Faintly marked striæ over right lower ribs in lower dorsal postero-lateral region. A few also over posterior folds of axillæ. Always lies on right side. Gained 11 lb. in last six weeks.

CASE 5.—Male, aged 15, poor nutrition, with pleural effusion of left side, which gradually resolved over period of three months. Irregular evening temperature for first month. A few purplish striæ in lower dorsal region left side. Lies on left side. Gained 19 lb. in three months.

CASE 6.—Male, aged 15, with advanced rheumatic endocarditis. Ascites and œdema of legs on admission which rapidly disappeared. Large liver and spleen. Confined to bed three months. Slight pyrexia occasionally. Striæ distensæ of recent origin noticed in right lower dorsal region in February, 1923—i.e., three months after admission. Usually lies on back, but frequently on right side.

CASE 7.—Female, aged 18, rather fat, with morbus cordis of rheumatic origin, auricular fibrillation, and recent infective endocarditis. In hospital for six months in 1921, when striæ developed in right lower dorsal region. By 1923 these had become very deep pearly-white scars running more or less parallel with the lower dorsal ribs. Below these on the right flank were very prominent raised striæ passing obliquely upwards and forwards from the posterior part of the iliac crest towards the abdomen, ending in the nipple line. These were almost keloid in appearance, and were called striæ hypertrophicæ. In the left lower dorsal region and over the delto-pectoral triangles and the front of the abdomen were more recent scars of a livid hue. These were transverse over the back and more or less vertical over the arms and middle of abdomen, becoming more oblique as they approached the flanks. The liver was enlarged and tender, and there was some ascites. Two days before death patient complained of a well-marked, tender, recently formed stria present in each iliac fossa. During her previous illness in 1921, patient stated she used to lie on her right side; recently she remained almost entirely on her back.

CASE 8.—Female, aged 15, with mitral stenosis following two attacks of rheumatic fever. Confined to bed entirely for two months, and then got up gradually. Pyrexia for first fortnight. Striæ distensæ in lower dorsal region on both sides and in mid-line of back appeared about two months after admission to hospital. Always lies on back. Gained 6 lb. in four months.

CASE 9.—Male, aged 21, with parenchymatous nephritis of three months' duration, associated with œdema of thighs and lumbar region. Recently formed purplish striæ in lower dorsal region on both sides and also on thighs. Irregular evening temperature throughout illness. Always lies on back.

CASE 10.—Female, aged 24, with large liver abscess, secondary to small localised appendix abscess. Consolidation of right lower lobe. Very large liver. Duration of illness two months. Marked pyrexia and toxic symptoms throughout. Very marked lineæ distensæ over lower dorsal region almost entirely on right side, noticed about six weeks after onset. Lies on back.

Ætiology.

It appears that in some cases the striæ occur as a direct result of distension from within, caused by subcutaneous œdema, or pleural and peritoneal effusions. I have recently seen striæ over the dorsum of both feet in a girl aged 12 suffering from pronounced cardiac œdema, and conclude that a simple distension of a badly nourished skin was the cause of their appearance. The striæ on the thighs of Case 9 were probably produced in the same way.

They are, however, often found in the absence of any sort of effusion, and can then be classified according to the anatomical position which they occupy: 1. Striæ found in the neighbourhood of the anterior axillary fold, and on the breasts, abdomen, thighs, and buttocks. In all these situations there is a tendency for fat to accumulate. 2. Striæ found in the lower thoracic region and above the patellæ. In these situations there is very little tendency for fat to accumulate, and the effect of position seems a much more potent factor. In both cases the underlying features of production are the same. Kai Hammer[8] has reported a series of 12 tuberculous cases, all of which fall into the first group described above, and concludes that they are due to distension of the skin caused by the rapid accumulation of fat in the subcutaneous tissues.

I have recently seen two cases which support this view. One was a girl, aged 20, in perfect health, who had gained 1 stone in nine weeks, and whose thighs had increased 1 in. in circumference. She consulted me because she had noticed some livid mauve lines running vertically on the inner and outer sides of both thighs. On examination these were found to be well-defined striæ distensæ. The other case was a young man who, during convalescence after an empyema, had gained 1 stone in 12 weeks, and had developed striæ over both deltoids and above the anterior axillary fold. He stated that his chest measurement had increased to such an extent that his coat and waistcoat, which had previously been loose, now felt extremely tight and uncomfortable.

It seems that there is one group of cases at the adolescent period characterised by striæ in situations where large deposits of fat are rapidly laid down. In this group the growth of the skin is unable to keep pace with that of the subcutaneous tissues and the striæ occur as a result of this rapid distension. Hammer's conclusion that the striæ of pulmonary tuberculosis are directly due to a gain of weight appears unwarranted when their occurrence in other situations such as the thorax is considered. Among my ten cases of thoracic striæ only two showed any appreciable gain in weight. The comparative frequency with which the striæ have been found in typhoid and other prolonged diseases in which there is a tendency to lose flesh also does not seem to support Hammer's theory. Other observers have taken the opposite view—namely, that the striæ are the result of emaciation and malnutrition, a theory for which, per se, there also appears to be very little evidence.

A neurogenic origin has been suggested by several people, but no conclusive evidence for this has been produced, and it is impossible in the majority of cases to correlate the situation of the striæ with the disease from which the patient is suffering. Striæ distensæ are frequently found on the side opposite to that of the lung lesion, which fact, together with the absence of any pain, is difficult to explain on the basis of a neurogenic origin. Similarly there is no evidence to support the theory that there is a trophic influence at work on the skin. If this were the case why are the striæ usually so localised, and why are there no obvious sensory or vaso-motor changes? It is possible that minute hæmorrhages or thromboses may occur in the skin and play a part in the production of the striæ. The section of one of my cases examined microscopically certainly shows many points of hæmorrhage into the dermis.

The effect of posture, however, seems much more important, a point on which Parkes Weber [15] has already laid emphasis. In those patients who generally lie on the back the striæ were found on both sides of the mid-line, although it was noticed that there was a tendency for them to be more marked on the right side, possibly from the fact that the majority of people lie more on the right side than on the left. The position and weight of the liver may also affect this. Where the striæ were confined to one side I found on inquiry that without exception the side affected was the one on which they were accustomed to lie or had lain during their illness. In those patients who are in the habit of lying on their backs and who while in bed adopt a semi-reclining position with their shoulders propped by pillows, the lines are found in the lower dorsal region, which is the position of greatest convexity, where the skin is maintained at its greatest tension. Similarly, in a person who lies on one side, the point of maximum convexity is in the region of the postero-lateral portion of the lower part of the thorax where the striæ are commonly found. In the same way, transverse striæ are produced above the patellæ in patients who lie in bed with their knees drawn up, particularly in abdominal conditions such as typhoid. In cases of pleural effusion one may expect to find striæ distensæ on the homo-lateral side. In pulmonary tuberculosis, however, when the lesion is more or less one-sided, the striæ are found on the contra-lateral side. This is due to the fact that patients with unilateral pulmonary tuberculosis nearly always lie on the unaffected side.

Cramer [12] described seven cases of more or less unilateral pulmonary tuberculosis, in all of which the striæ were found on the contra-lateral side. This was ascribed by him to the compensatory distension of the chest on the healthy side, but although there is no record as to which side they lay on, it seems probable, in view of the nature of the disease, that it was on the healthy one, on which side the striæ appeared. All my cases were confined to bed for long periods, the shortest being six weeks, during which time the majority of them had well marked and continued pyrexia. This is not regarded as an essential factor in the production of the striæ, particularly as they have been found to occur in the absence of any fever, but it is merely a manifestation of the toxæmia of varying degree which appears to be a common factor in the debilitating diseases with which these cutaneous changes are frequently associated.

The narrow age-limit leads one to suppose that the skin at this period is much more susceptible to such changes. From 15 to 20 is the age when great structural alterations in the body, particularly the skin, are taking place, and if the nutrition is at all impaired by any toxic condition or prolonged disease, the skin being very delicate, the elastic fibres are more easily ruptured when subjected to any strain. This condition is somewhat analogous to rickets, where within a definite age-period, bony changes occur as a result of deficient nutrition.

Relation of Striæ Distensæ to Lineæ Gravidarum.

An interesting point is the relation of these striæ distensæ to lineæ gravidarum. Is the mode of origin the same in the two cases? Some observers are inclined to think that it is, but although there is some similarity it seems probable that the two conditions are not identical. Lineæ gravidarum are found at any age during which pregnancy occurs, while the age-period is very strictly limited in the case of striæ distensæ. There is also a difference in colour. The striæ gravidarum are pinkish-white in appearance even when first formed and never present the livid purple colour of striæ distensæ, which seems to indicate a more profound change. One might argue that the general nutrition of the body, including the skin, is lowered during pregnancy, and that the pressure of tight clothing on the distended abdomen acts in the same way as the pressure produced by lying in one position. A comparison of the microscopical appearances in the two conditions should throw some light on the question, but I have unfortunately not had the opportunity of doing this.

Microscopical Appearances.

In only one instance (Case 7) have I been able to obtain sections of the striæ for microscopical examination. These, together with control sections of normal skin, were stained by the Pianese method, and also by a combination of Van Gieson's and Weigert's stain, which demonstrated the elastic fibres very clearly. The epidermis showed no appreciable difference as compared with the normal skin, but well-defined changes were observed in the cutis vera. The connective tissue bundles appeared to be more spread out and parallel than in the normal, but the most noticeable change was in the elastic fibres, which were broken up into small strands and scattered irregularly over and around the connective tissue bundles instead of being intimately intertwined among them. In the centre of the stria the elastic fibres seemed to have disappeared entirely, but their retracted stumps were found lying curled up in little bundles on either side. Sections of the hypertrophic striæ from the same patient showed a great increase of connective tissue layer, scattered through which were a great number of blood-vessels. In these sections there appeared to be very little elastic tissue, and what there was was confined to the periphery of the scar.

Conclusions.

The conclusions at which I have arrived are:—

1. That striæ distensæ are confined almost entirely to young adults between the ages of 12 and 22.
2. That at this age the skin is very delicate and growing rapidly, and that the elastic tissue fibres rupture allowing the white fibrous tissue and overlying epidermis to stretch, giving rise to striæ distensæ.
3. That striæ distensæ may be associated with almost any febrile illness.
4. That the distension and ultimate cleavage of the skin may be caused in healthy individuals by the rapid accumulation of fat in the subcutaneous tissues of the axillæ, thighs, &c.
5. That in other cases it is due to a simple distension following an effusion into the subcutaneous tissues.

6. But that often the nutrition of the skin is impaired by some constitutional disease, and that the main factor in these cases is the effect of posture—the striæ occurring at the position of maximum tension.

Finally, I wish to express my thanks to the physicians of the Victoria Park (Chest) Hospital for their courtesy in allowing me to publish these notes of the cases under their care, and to Mr. A. W. Smart, of the Pathological Department, for preparing and staining the skin sections.

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HOME DISINFECTION AND THE CONTROL OF SCARLET FEVER.

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THE following remarks regarding scarlet fever and home disinfection apply to that disease, neither as representative of infectious diseases as a whole, nor, generally speaking, to the practical sanitary measures necessary in all cases for their prevention. It would be quite fallacious, for instance, to suggest that tuberculosis—a disease differing widely from scarlet fever both ætiologically and epidemiologically, although possessing the common feature of infectivity—could be controlled similarly to scarlet fever from the preventive standpoint.

The chart, which is taken from the annual report of the medical officer of health, Croydon, for 1922—in great measure a replica of that produced the previous year—shows clearly that the most important factor in the spread of scarlet fever is school attendance, the disease waxing or waning according as the public elementary schools of the borough were open or closed during the year, allowance being made for the pre-school period of life which always accounts for a considerable number of cases. Although milk supplies, laundries, domestic animals, &c., have all been credited in the past, and probably not without some good reason, with furthering the spread of scarlet fever, the fact remains that the disease is one, in the great majority of instances, affecting school life and the pre-school period, and that by far the most important agent in its spread is school attendance, although in a minority of instances other factors, such as those mentioned, do from time to time play a certain part, although even in them a missed case or a carrier is, in all probability, the primary focus of dissemination.

Spread of Scarlet Fever.

Scarlet fever is spread by actual cases of the disease, carriers, and to a less extent by fomites, provided sufficient pabulum for an outbreak—general or sporadic—is available in susceptibles, that immunity which is known to exist during the first year of life becoming in many cases exhausted in succeeding years. Actual cases of scarlet fever may be recognised or not, the latter group including mild cases confused with rubella, and others which may have been missed altogether. Definite cases, generally speaking, explain the spread among home susceptibles, see table, column C, where the primary case is nursed at home, whilst mild ambulant and missed cases are responsible for a certain percentage of those spread by school attendance, the majority of school infections being, in all probability, due to the carrier. Carriers in scarlet fever, as in other similar infections, are of two types—the direct and the indirect—and in some 50 per cent. of cases may exhibit certain obvious clinical symptoms associated with the carrier state. The direct carrier has previously suffered from the disease, whilst the indirect carrier, so far as is known, has not. Direct carriers include those also who, after return from home or hospital isolation, have given rise to "return" cases. Carriers, therefore, in many instances may attend school from homes which have been previously disinfected to the satisfaction of the sanitary authority, and may also presumably come from homes where there has been no previous suspicion of infection. Parenthetically the value of home disinfection can, even at this juncture, be seen to be almost nil in so far as the danger to be apprehended from the carrier is concerned, who after the customary period of isolation has returned to school, disinfection meanwhile of the home playing no part in any lessened tendency to further spread of infection through the medium of school attendance and carriers, or the further infection of home susceptibles by carriers before resuming school. Fomites include all infected or presumably infected articles in a home where a case of infectious disease is known to have occurred.

Home Disinfection.

Disinfection, as at present carried out by most sanitary authorities, briefly consists in spraying infected rooms and fomites with either a weak solution of izal or formalin, or generating sulphur dioxide by burning sulphur candles on the premises (besides certain other less commonly practised methods occasionally made use of) after the patient's removal to hospital, or where the case has been nursed at home, after the return of the case from isolation. At the same time the clothing and bedding of the patient are usually removed and disinfected by the sanitary authority—in my opinion the only useful part of the procedure. In the table will be found certain particulars relating to the incidence of scarlet fever during the years 1921 and 1922 in Croydon, excluding for reasons of comparison all cases occurring at institutions during the period. Col. A deals with all cases removed to hospital and where the home was disinfected within 48 hours. Col. B deals with cases nursed partly at home and partly in hospital during an epidemic period extending from the beginning of

Table giving Particulars Relating to Scarlet Fever Cases Notified during the Years 1921 and 1922, but excluding all Cases occurring at Institutions in the Borough of Croydon.

Col. A.—Hospital cases removed within 48 hours.

Col. B.—Home cases and hospital cases (nursed more or less at home and hospital—epidemic period).

Col. C.—Home cases, including a small number not removed during epidemic period.

—	A.	B.	C.
Number of cases notified	972	254	239
Number of "susceptibles" under 15 years of age in infected houses at onset of illness of primary case ..	1148	301	155
Number of secondary cases occurring from onset of primary case. (1) During first seven days ..	85	13	17
Percentage to susceptibles	(7·49)	(4·31)	(10·96)
"Incidental" infections—i.e., (2) after seven days and prior to the primary case leaving isolation or before return from hospital ..	50	20	18
Percentage to susceptibles	(4·35)	(6·64)	(11·61)
(3) "Return" infections	35	1	1
Percentage to susceptibles	(3·1)	(0·33)	(0·64)
Total of "incidental" and "return" infections	85	21	19
Percentage of this total to "susceptibles"	7·3	6·9	12·2

November, 1921, to the end of April, 1922, when the isolation hospital was over-full. These latter cases were removed as and when hospital accommodation could be found, the usual home disinfection being subsequently carried out. Col. C deals with home cases entirely. The percentage of secondary cases to susceptibles is greatest among home cases—obviously due to direct infection from the primary case—both during the first seven days after occurrence, 10·96 to 7·49 and 4·31, and subsequently ("incidental" infections), but prior to the return of the original case from isolation, being 11·61 in home cases compared with 4·35 and 6·64 respectively in the others.

With regard to hospital cases which were removed and the home disinfected within 48 hours, the infective influence of the primary case may not have been altogether effaced before the end of the first week, but subsequently to that period and disinfection the primary case can presumably hardly be expected to have exerted any influence at all upon the occurrence of subsequent cases. Disinfection and hospital isolation, therefore, fall considerably short of preventing secondary cases amongst susceptibles in homes where primary cases have occurred, whilst we see from the chart that the disease is spread in the great majority of instances through missed or carrier cases attending school or carriers of pre-school or school age at home, factors over which home disinfection exerts no control, even assuming for purposes of argument that such disinfection has been accurately and effectively carried out. (Other facts borne out by the table, such as the superiority of hospital over home isolation, and the greater proclivity for hospital cases to account for "return" cases, does not concern the further trend of this article.)

If fomites and infected houses, rather than carriers and mild cases, are to be credited with the spread of scarlet fever generally, it is obvious how almost useless the practice of disinfection has been, almost amounting to a confession of failure hitherto to prevent the further incidence of dissemination of infection, whether we consider the incidence of home or school cases.

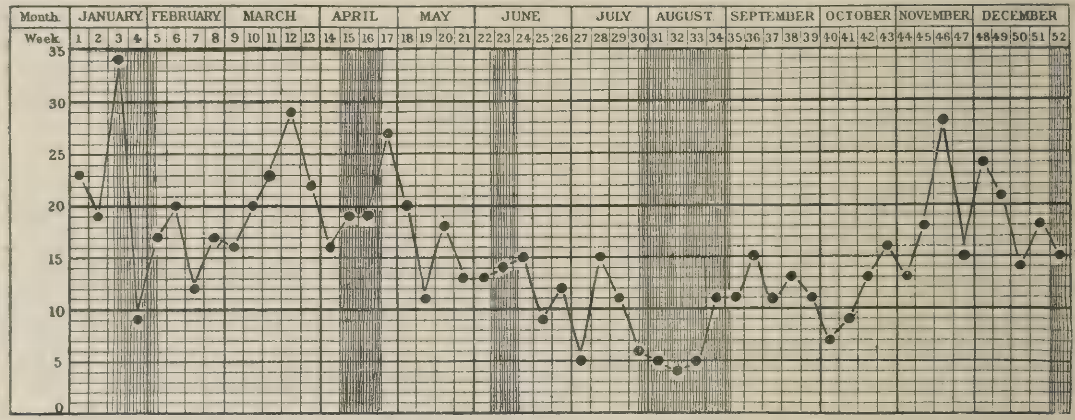
Carriers of the Disease.

How, it may be asked, is scarlet fever perpetuated, and how is the outbreak initiated? The answer, I believe, is in both instances, through the recent or chronic carrier, the former instrumental in acute outbreaks, while the latter, mainly recruited from the former, is concerned with the appearance of sporadic cases and the initiation of actual outbreaks. A defect in the chain of sequence is, however, created through our still incomplete knowledge of the bacteriology of this disease. Whether or not the particular causative streptococcus described represents more than a symbiotic combination conditioned by the pathological states present in the sufferer or carrier and analogous to the association of Hofmann's bacillus with the throat in diphtheria, we have yet to learn.

A carrier probably possesses two requisites—a particularly low bactericidal power for some specific micro-organism, and an abnormal or pathological condition of the naso-pharynx suitable in the case of scarlet fever either for its parasitic endurance, or more probably some resting phase of its existence. On the other hand, the condition present—pathological or otherwise—may be such that the parasite cannot effectively be dealt with by the anti-parasitic powers of the host. An actual outbreak of scarlet fever is, so far as we can tell, dependent upon a degree of overcrowding either at home or in school during the presence of certain meteorological conditions met with in England, more particularly during the last quarter of the year, and presumably absent in some tropical parts where the disease has not yet appeared. When cases of scarlet fever begin to appear, can the disease be, in any particular, further prevented by disinfection after the primary case has been removed to hospital? I think not with any degree of success, because, as I have already attempted to show, the disease is mainly, if not entirely, spread by carriers and mild or missed cases both at home and through school attendance, and secondly because home disinfection cannot in any sense of the word be regarded as complete and satisfactory. Complete disinfection of an infected room cannot, for example, be satisfactorily carried out in the many one-roomed tenements met with in any of our large towns, unless all the contacts could be removed from their surroundings for some 24 to 36 hours. The clothing of the contacts again—in many cases the only clothing possessed—cannot practically be dealt with as regards satisfactory disinfection, assuming that contacts are infectious through their clothing, a point which I am not prepared, to any extent, to admit.

To summarise the question of home disinfection, therefore, it will be admitted that at best it is little more than a formal, much less than a complete proceeding, and consequently can neither reasonably prevent subsequent infection occurring in an already apparently disinfected home amongst susceptibles—susceptibles of school age being meanwhile excluded from school—nor the subsequent spread of the disease once an outbreak has occurred which is, as already suggested, almost entirely dependent on carriers and school attendance, rather than fomites, leaving out of account for the present sporadic cases met with from time to time in the adult. I am strongly of opinion that much of the funds at present spent upon disinfection could be more usefully employed in creating a healthier state of the naso-pharynx of the school-child by directing greater precision to the examination and

Chart Showing Weekly Notifications of Scarlet Fever, 1922.



The shaded portions represent periods during which the schools were closed.

treatment of all such defects discovered upon routine medical inspection of school-children, by preventing overcrowding in schools, and by the prompt closure of all schools or school departments—public, private, and Sunday—in any area threatened with an outbreak of scarlet fever. By these measures can it be hoped, in the future, to more surely approach the eradication of such a scourge of young life as scarlet fever is, rather than by further pursuit of the phantom of home disinfection, at best but an incompletely carried out procedure justifying neither the time nor the money spent upon its performance.

So far as home disinfection is required after the patient's removal, blankets, &c., from the home used in conveying him or her to hospital should, as a matter of course, be disinfected before their return, whilst the further disinfection of the home need only, in my opinion, be directed to an effort on the part of the occupants to spring-cleaning their infected room or apartments by the application of the less extravagant if not equally efficacious disinfectant properties ot sunlight, soap, and water. Such an arrangement, however, would not prevent householders who wished their premises disinfected after the orthodox manner from having the same carried out by the sanitary authority on the payment of an arranged fee.

The opportunity was taken at the outset of this article to emphasise the fact that remarks applicable in so apparently simple a matter as home disinfection after scarlet fever would not necessarily be true in respect of other infections belonging to a different category, such as tuberculosis. In closing, let it be similarly emphasised that the aim of this article has been not an attempted refutation of the principles of disinfection when rightly and appropriately used, but rather an analysis of the present inadequacy and inutility of home disinfection as a means of controlling the spread of scarlet fever.

BRITISH MEDICAL ASSOCIATION.

ANNUAL MEETING AT PORTSMOUTH.

(Continued from p. 362.)

SECTION OF NEUROLOGY AND PSYCHOLOGICAL MEDICINE.

WEDNESDAY, JULY 25TH.

AT the opening session Dr. HENRY DEVINE (Portsmouth), the President, gave a short address in which he recorded the changed outlook of psychiatry which was coming to regard itself as a branch of general medicine. A discussion on

The Nervous Child

was opened by Dr. H. C. CAMERON (London), who said that he proposed to confine his remarks to two aspects of the wide subject which he had to talk about. He would describe certain peculiarities of physique and posture which were frequently found in the nervous child and would examine briefly the rôle played by parental management in provoking or controlling the disturbances of behaviour for which advice was sought. In most nervous children one was struck by the want of tone in the skeletal muscles. The trunk was not braced by the muscles at the back, the feet tended to be separated, and the shoulders carried far back, the abdomen being pushed forward, while the chest receded. The lack of tone in the shoulder muscles allowed the weight of the upper limbs to depress the points of the shoulders and so produced winged scapulæ. As a rule the small muscles of the face and hands were in constant movement, but in some of the worst cases the facial expression had been that of complete apathy. The posture and movements of the child were a good index of the state of the nervous system. Lack of tone was not confined to the skeletal muscles, but also involved those of the heart and blood-vessels, hence the pallor usually seen in these children. Albuminuria and cyanosis of the extremities were also common. Attacks of abdominal pain, and sometimes of vomiting, were generally due to emotional excitement or fatigue. The defect of posture sometimes led to enteroptosis. These children also were subject to frequent catarrhal infections, their lack of immunity probably being associated with the poor vaso-motor tone. Children of this type also tended to show abnormal temperature variations, giving a subnormal reading when exhausted, and showing variations above the normal when excited and flushed.

The study of the nervous child was to a great extent a study of his parents. In hospital little, on the whole, was seen of functional nervous disturbances because of the change of environment. At home the reaction of the child depended very largely on that of the mother. The young child was very prone to suggestion. Whatever was thought of him, said of him, even feared for him, that he was apt to become. Therefore, the symptoms of functional nervous disturbance among children were usually those about which the mind of the ordinary mother was most preoccupied. When a whole household was openly distressed by some abnormality of behaviour the child quickly caught the feeling and himself became anxious and apprehensive. This applied particularly to children who suffered from persistent anorexia or enuresis, whose mothers were usually found to be despondent and pessimistic. Timidity and foolhardiness likewise depended very largely upon the mother's attitude. Negativism in the child was usually found when there were frequent and repeated attempts at control with constant failure to achieve it. Children responded to the moods of their parents in a remarkable way. When the mother had lost her peace of mind, refusal to sleep, refusal of food, or refusal to go to school became formidable difficulties. Refusal of food was often the response of the restless child to the excessive urging of the mother. Amongst the poor one often encountered the opposite fault. Here the price of food being an important consideration, it was apt to be doled out grudgingly with comments upon the child's appetite, and the child responded to the stimulus by becoming a prodigious eater. Similarly, of eight cases which had been brought to him for insatiable thirst, only one had diabetes. In the other seven the demand for fluid grew as a result of the obvious reluctance with which it was conceded. He illustrated these points by means of several illuminating cases. Closely connected with the child's proneness to suggestion was his instinctive desire to assert himself and make himself the centre of the picture. To this end children might develop most extraordinary symptoms. He quoted instances in which the strangest abnormalities of behaviour proved to have their origin in a simple desire to create a sensation at any price. To understand the child, therefore, one must first understand the parent, and use the all-powerful influence proceeding from parent to child in the treatment of the disorder.

Dr. C. MACFIE CAMPBELL (Assoc. Prof. Psych., Johns Hopkins) remarked that Dr. Cameron had dealt in his paper mainly with the physical aspect of the nervous child. It was a fact that children of this type were often found to be suffering from some fundamental physical inferiority. It was in these cases that the psychiatrist looked for help from the physician. The psychopathologist was especially concerned with the problem of the child which was physically normal but presented abnormalities of behaviour such as pilfering, lying, and temper tantrums. It was important to realise a child as an individual personality with its own personal difficulties, and to appreciate that these might be of two kinds: Difficulty, on the one hand, of adapting to external situations; and, on the other hand, difficulty in the adjustment of the internal emotional forces to one another. Dr. Cameron had confined himself to the external difficulties, and the speaker found himself in complete agreement with what he had said about the importance of parental management. If the nervous child were to receive adequate treatment it was frequently necessary to get the parents to readjust their own scale of ethical values. He thought that on the whole people were ready to do this if they could be convinced that the health of their children depended upon it. In the case of the nervous child the psychiatrist was, as a rule, consulted for a symptom; he found it necessary to study the whole child and that led to a study of the whole home.

Dr. **HELEN BOYLE** (Hove) agreed with the President's contention that neurology and psychiatry should be considered as a single field for investigation. She was especially interested in the nervous stance which Dr. Cameron had described. She asked whether this was due to a constitutional physical defect, or whether it was simply the bodily expression of an emotional attitude—a disheartened stance. She thought on the whole it was the latter, and compared what she described as the war and post-war stance of adults as indicating the natural posture of a person suffering from fatigue and depression. She had analysed her own experience in the case of 40 children and had come to the conclusion that when a child compensated for its sense of inferiority its stance improved. This was so whether the compensation was a correct one from the social standpoint or not.

Dr. W. A. **POTTS** (Birmingham) thought that in some of these nervous children the trouble might be due to disturbance of the endocrine balance. He had known cases in which the administration of small doses of thyroid was followed by remarkable improvement. In other cases he thought the overgrown child might have exhausted its pituitary reserves, which might perhaps be restored by means of the administration of pituitary extract. He emphasised the importance of the parental attitude, not only in its direct influence on the child but indirectly through the example. Adaptational failure in the parent often led to similar failure in the child. With regard to treatment, he laid stress upon the importance of fresh air and of proper clothing. The parents' ideal in training the child should be to watch but not let the child know that it was being watched. He considered it most important that every child should have instruction both in some simple form of religion and also in the origin of life.

Dr. H. **CRICHTON MILLER** (London) regretted that Dr. Cameron had not gone more deeply into the question of ætiology of the amyotonia in these children. It was in matters such as this that the psychiatrist looked for help from the physician. He suggested that the cause might be a defect in the calcium metabolism associated perhaps with parathyroid deficiency. The problem child, however, was often physically fit. In the course of progressive adaptation the child depended to some extent upon the stimulus of social opinion. The only child, being sheltered from the world, lacked the stimulus to deal with its own difficulties. With regard to the treatment of delinquents, he pointed out that a child will often prefer to be punished as a criminal rather than be ignored as a mediocrity. In the treatment of many of these conditions it was most necessary to switch off the limelight. A common problem of childhood about which medical men were consulted was enuresis. This was the supreme example of the infantile state and was a symptom of failure of progressive adaptation. There was a danger lest the child who was threatened with the social consequences of this habit might develop a revenge motive towards society, in its desire to secure compensation for being treated as an outcast. Hence the association with enuresis of habits such as wilful stealing and lying.

Sir **ROBERT ARMSTRONG-JONES** (London) referred to the existence of a National Society for the Education of Parents which was doing good work. He maintained the importance of the maxim "Don't say 'Don't.'" One should reason with the child, and lead rather than force. In training, the principle of retributive justice should be adhered to. He considered that a full allowance of sleep was of the greatest importance to children. A child of the nervous type should get at least 12 hours nocturnal rest, if not sleep, up to the age of 15. He wondered whether some of the moral imbecility seen in later years was not a product of the nervous child badly handled. He emphasised the importance of teaching children harmony of movement.

Dr. R. G. **GORDON** (Bath) asked what lay behind the desire to attract, the negativism, and other trends of the nervous child. Was it a matter of predisposition? McDougall regarded certain instinctive dispositions as fundamental and considered character as formed by environmental influences acting upon these factors. In the nervous child one or more of these instinctive dispositions might be over-stressed. He brought forward evidence to show that despite McDougall's theory a given set of instinctive dispositions did not always lead to the development of the same quality of character. Nervousness in the child expressed a failure of integration. In view of Bianchi's work, this failure might be correlated with a failure of development of the frontal lobes. He thought that analytic methods in young children were not likely to be successful because the child was incapable of understanding the treatment.

Dr. G. F. **HARFORD** (London) referred to the importance of squint in relation to nervousness in children. He referred also to a resolution carried at the last annual meeting of the Section to the effect that instruction in psychopathology should be included as an essential part of the medical curriculum.

Mr. W. S. **INMAN** (Portsmouth) referred to the frequent association of squint with left-handedness, and the association of left-handedness with stammering. He thought that the left-handed child, who remained so, was often the successful rebel against parental endeavour to compel right-handedness; whereas the unsuccessful rebel frequently became a stammerer.

Dr. L. A. **PARRY** (Hove) thought the nervous child was far more common to-day than 15 or 20 years ago. Dr. Cameron had given instructions for treatment; how far could the general practitioner be expected to effect a cure along these lines? He thought the percentage of parents who could be influenced was very small. He agreed with Dr. Potts as to the necessity of religious instruction. He did not think it advisable to instruct children in sex matters.

Dr. **POTTS** explained, in reference to Dr. Parry's remarks, that he did not consider deliberate instruction in sex matters necessary or advisable, but thought that the child's questions upon this subject should be frankly answered.

Dr. S. D. **BHABHA** (London) said that in the experience of his practice in East London nervousness was rare amongst Jewish children notwithstanding popular belief to the contrary.

Dr. P. **MACDONALD** (York) referred to the importance of postural training in the treatment of nervous disorders.

Dr. F. G. **LAYTON** (Walsall) referred to the difficulty of treating the nervous child in the back streets where the environment of the nursery was lacking.

Dr. A. G. **WILKINS** (Stafford) pleaded for better school accommodation in the future. He favoured the plan of open-air schools wherever possible.

Dr. **CAMERON**, in reply, again emphasised the fact that the emotional attitude of the child depended upon the emotional attitude of the mother. With regard to the ætiology of the stance of the nervous child, he thought an important point was the tendency of the child to react to any kind of illness in certain ways at different phases of its life. In infancy the digestive system was usually upset; later on locomotion and posture were thrown out of gear, whether the illness was due to a chronic infection or to a disturbance of the emotional life. He had found that class training in physical exercises had a good effect upon the attitude of both mind and body of these children. The slum child should be treated through the mother. Once the mother's confidence in her own ability to handle the child satisfactorily had been re-established treatment was likely to be successful.

THURSDAY, JULY 26TH.

On the second day, Dr. C. M. HINDS HOWELL being in the chair, Dr. E. F. BUZZARD opened a discussion on the

Sequelæ of Encephalitis Lethargica.

Referring to the difficulty of distinguishing between the primary results and the sequelæ of the disease, he defined sequelæ for the purpose of discussion as (1) those disorders of function which appeared for the first time after the disease had spent itself, and (2) progressive alterations in defects of function which had been left as more or less permanent legacies of the disease. It was probable that our list of sequelæ, already long, would still be added to, for every function of the nervous system might be affected. Mental sequelæ were common, therefore it was a matter of practical importance to warn the relatives that even a slight attack was apt to leave the nervous system below par for many months or even years. Unless such a warning note was sounded, patients were apt to return to work before they were fit, sometimes with disastrous results. In the majority the mental symptoms did not amount to more than lack of energy, depression, and insomnia, but in some instances there occurred profound alterations in the personality. He quoted cases illustrating this point. Perhaps the worst cases of this type were seen amongst children.

Involuntary movements might occur in the acute phase of the illness or make their first appearance later. They varied from rhythmical twitchings of one or two muscles to more complicated movements involving a whole limb. Generally they did not interfere seriously with voluntary activities. He referred in detail to a case in which the involuntary movements had been extensive and severe. In this case the muscular contractions were regular and their frequency corresponded to the pulse-rate—about 72 to the minute. The general tendency was for these involuntary movements to disappear in the course of time. The Parkinsonian syndrome was one of the commonest sequelæ. It might develop early, gradually become less marked, and never progress. At the other extreme was a group of cases in which the disability steadily progressed. Respiratory disorders were not uncommon and were of great interest. Hiccough and vomiting were frequent complications, and might persist for months after the illness. Optic neuritis was not infrequently observed at the height of the disease. Foster Kennedy had drawn attention to its occasional occurrence as a late symptom in convalescence. Lethargy in some cases might be regarded as a sequela, and might occur in the form of periodic attacks with headache. The explanation was probably a mild degree of hydrocephalus.

As to the pathogenesis of sequelæ, he thought that the inflammatory changes in and around the vessels played a large part in their development. There were, however, certain other sequelæ which could hardly be attributed to vascular deficiencies. He regarded the lethargy of encephalitis as probably dependent upon mechanical interference with the drainage of cerebro-spinal fluid from the third and lateral ventricles. Possibly meningeal thickenings and loculated cysts might also account for certain of the sequelæ. We were still without any specific treatment for the disease. Perhaps some of the mental disabilities might be avoided by insisting upon an adequate convalescence. Tremor might perhaps be lessened by means of hyoscine. And in one case of Parkinsonian rigidity suppositories of belladonna had produced temporary improvement. Generally a combination of psychotherapy and physical re-education had to be the basis of treating the sequelæ.

Dr. G. RIDDOCH (London) remarked that Dr. Buzzard had confined himself to sequelæ of two kinds: permanent after-effects and subsequent results of the original illness. He proposed to deal with the subject of relapses which he believed occurred in some cases. He cited the instance of a woman who, five years after an original attack of encephalitis lethargica, which had left her with a residuary ptosis, had a definite recurrence with mental and physical symptoms. He also quoted statistics relating to cases followed up from the out-patient department at which he worked. Mental deterioration had occurred in more than half the cases, and of these a large number were among young people—children under the age of 6 being perhaps most frequently and most severely affected. He quoted instances in which outbursts of uncontrollable temper and signs of moral degradation had followed the illness. Character changes of this kind were not necessarily associated with intellectual deterioration. Cranial-nerve palsies formed a group of common sequelæ and appeared in three-fifths of the cases, the nerves most frequently affected being the third, fourth, and sixth. He had seen persistent tachycardia both in the original attacks and as a sequela; and also attacks of respiratory distress, one of which had ended fatally. Symptomatic paralysis agitans was very common in the majority of cases. It was progressive and it was often associated with cranial-nerve palsies. This syndrome was not necessarily accompanied by mental deterioration. In his experience, myoclonic movements tended to disappear if the patient did not die. Movements of the choreo-athetoid type tended to persist. Anæsthesia was a rare symptom, but pain a common sequela. In all cases he thought the prognosis must be very guarded, because the virus probably smouldered on in the tissues for some time and might flare up at any moment. In the treatment of the involuntary movements he had found hyoscine hydrobromide useful.

Dr. HINDS HOWELL referred to a series of 34 cases which had come under his personal observation in the acute stage of the disease. Of these six died and 11 made a complete recovery. Of the remainder, he had been able to follow up the majority, and had also studied a number of other cases who had first consulted him for the sequelæ of the disease. He referred to three cases which developed Parkinsonian symptoms in their original illness, but had eventually recovered completely. He thought that an accurate prognosis in the early stages was extremely difficult—if not impossible. Patients who developed the Parkinsonian syndrome early, together with ocular palsies, he thought on the whole did badly; and in general he thought a bad prognosis was justified in cases which showed signs of severe involvement of the mid-brain. Some of the Parkinsonian cases tended to become progressively worse. On the other hand, he had a patient with choreo-athetoid movements who was doing well. Personality changes, in his experience, were the commonest sequelæ, although none of his cases had needed certification. The chief symptoms were loss of emotional response and slowness of the intellectual processes. There might also be impulsive actions, and these might take a suicidal form. The mental symptoms did not tend to improve. In the Parkinsonian cases he had noticed that the tremor was much less than the rigidity, and was as a rule coarser than that of true paralysis agitans. The commonest ocular defects were loss of convergence and accommodation. Of sleep disturbances, that which he had seen most frequently was a reversal of the rhythm occurring in young children. He referred to several instances in which there had been disturbance of the respiratory rhythm. He had noticed that seborrhœic dermatitis, especially of the scalp and forehead, was exceedingly common in these patients. Amongst other symptoms he had noticed abnormal appetite and obesity following the disease. He had never seen optic neuritis, and had generally considered its presence a point against the diagnosis of encephalitis lethargica. He was therefore all the more interested in Dr. Buzzard's observations. He thought that the frequent occurrence of rigidity as the sequel of a disease which particularly affected the mid-brain was of great interest in relation to the work of the physiologists upon decerebrate rigidity.

Dr. A. Feiling (London) confined himself to two aspects of the sequelæ in this disease: the ocular palsies and the Parkinsonian syndrome. In the first group he had found pupillary changes, such as inequality, loss of convergence and paralysis of accommodation, of common occurrence. Paresis of the extrinsic muscles was also common, unilateral or bilateral ptosis being of greatest frequency. These cases might closely simulate myasthenia gravis, for in encephalitis lethargica, as in the other disease, remissions and relapses might occur. He quoted a case in which, after an attack of encephalitis in September, 1920, a patient continued to suffer from ocular palsies, varying from time to time and from muscle to muscle over a period of 26 months. The Parkinsonian syndrome was familiar to all neurologists as a common sequel which might appear early or late in the history of the illness. He would refer to one or two points which were of use in differentiating between this and the ordinary senile form of paralysis agitans: (1) Many cases of the post-encephalitic form occurred at an age when true paralysis agitans was unknown. (2) The characteristic tremor was often lacking in the post-encephalitic form, whereas rigidity was constant. (3) Fragmentary conditions of rigidity were more commonly seen in the post-encephalitic cases. (4) Sialorrhœa also occurred more frequently as a sequela of encephalitis lethargica. In the matter of prognosis he thought that those cases in which the Parkinsonian syndrome commenced slowly after a long latent interval carried a bad prognosis, and this was especially the case in young children.

Dr. D. McAlpine (London) presented the results of an examination of the brain in two fatal cases. In one he had found some changes in the globus pallidus in the shape of perivascular cuffing and hyaline changes in the vessels, but the main incidence of the disease was upon the mid-brain. Serial sections of this part showed perivascular cuffing and remarkable changes in the pigmented cells of the substantia nigra. The pigment had disappeared from the cells and was scattered about the section. In the second case he found hæmorrhage into the basal ganglia on the right side and calcification of several arterioles in the anterior half of the globus pallidus. There were inflammatory changes in the mid-brain, but the substantia nigra on both sides was normal. Both these cases during life had shown symptoms of paralysis agitans. Both had died with symptoms of respiratory failure, but no changes of importance were seen in the medulla. Dr. McAlpine showed on the screen lantern-slides illustrating these histological changes. He referred in some detail to the literature of the subject and to the minute changes in the walls of the vessels, which he thought began with a deposition of fatty droplets, going on later to calcification. He had found similar changes in the acute stage of the disease, and had not, so far, been able to find them in cases of other disease with the important exception of a case of senile paralysis agitans.

Dr. C. P. Symonds (London) emphasised the fact that the severity of the sequelæ bore no constant relation to that of the original illness. It thus happened that many of these patients sought medical advice for sequelæ in whom the true significance of the original illness had escaped notice. In these cases diagnosis must be retrospective and depended largely on the history. He quoted the case of a young woman very severely affected by the Parkinsonian syndrome, whose original illness had been so slight that she neither went to bed with it nor sought medical advice. He had seen several other cases of this ambulatory type. In the presence of the Parkinsonian syndrome the retrospective diagnosis was, as a rule, easy. In other instances it might be more difficult. He cited the case of a man complaining of lassitude and presenting signs of minute involvement of the cranial nerves. On inquiry a history was obtained of a mild attack of encephalitis three months previously. Six months after the onset of this original illness he began to develop choreo-athetoid movements. These were controlled by hyoscine and had finally disappeared. The latent interval between the original illness and the development of the Parkinsonian syndrome might in his experience be as long as three years, but in these cases the patient could never fairly be said to have made a complete recovery from the original illness. If the patient recovered his mental and physical health after an attack and maintained this recovery for six months he thought he was free from further trouble. The involuntary movements received perhaps more than a fair share of attention. He had been especially interested in complaints of visceral sensory disturbance, such as sensations of suffocation, choking, nasal obstruction, and rectal tenesmus. Some of the sniffing and gasping movements seen in these patients might be due to this cause.

Dr. C. A. McBride (London) referred to Economo's work, showing that the virus might smoulder in the disease for a long period. He would confine most of his remarks to the occurrence of involuntary movements resembling those of spasmodic torticollis, and described two cases in detail to illustrate his remarks. We had learned from encephalitis lethargica that the symptoms of paralysis agitans might have an infective origin. Might this not be equally true of spasmodic torticollis?

Dr. Morris remarked that he had seen cases in which affections of the skin were distressing. He instanced hyperidrosis of the hands and trophic ulcer of the heel. He had also seen involuntary gaping movements of the jaw, which were accompanied by no sense of distress, but were beyond the patient's control.

Dr. W. A. Potts felt grateful to Dr. Buzzard for the explanation he had offered of the remarkable variations in the course of the disease, and quoted the case of a young woman who was completely stuporose one day and active on the next. As to treatment he thought that psychotherapy was certainly of value. In view of the calcification of the vessels recorded by Dr. McAlpine, had the administration of citric acid been tried? In some cases he had tried influenzal vaccines he had thought with some effect. He referred to two cases he had seen in a maternity hospital in which an erroneous diagnosis of eclampsia had been made, and in one case labour induced, in pregnant women suffering from encephalitis lethargica.

Dr. C. Charnock Smith (Hastings) referred to a case in which, on the advice of a colleague, he had injected turpentine into the leg—he was not sure whether this had been followed by beneficial results. He also mentioned the occurrence of confused mental states, especially in the evenings.

Dr. W. Hardcastle (Newcastle-on-Tyne) inquired as to the frequency of depression occurring as a sequel. When it did occur did it depend upon organic changes in the brain, or was it of psychogenic origin? He thought possibly that some of these cases might be helped with psycho-analysis.

Dr. Devine said, in relation to the statistics obtained from mental hospitals, that the psychiatrists had possibly overlooked a number of the cases in which the original illness had been of the mild or ambulatory type. He thought the correlation of the infective origin of this disease, and the nature of the mental symptoms observed, was of the greatest importance to psychiatry. Fundamentally we must conclude that all abnormalities of mental function depended upon changes of structure, however slight.

Dr. Macfie Campbell referred to the importance, from the point of view of treatment, of deciding whether symptoms were residual or whether they depended upon changes still active. Should one encourage the patient with Parkinsonian symptoms to rest or to make further efforts? He thought that further investigation of the cerebro-spinal fluid should be made in these late cases. With regard to the mental sequelæ, he had observed a marked difference between the reaction of the child and that of the adult. The former had frequently to be admitted to a mental institution on account of his anti-social outbursts. If the adult had to be placed under care, it was rather because his apathy rendered him unfit to look after himself. What was the explanation of this discrepancy in reaction?

Dr. **Buzzard**, in reply, said that as a result of the discussion we must conclude that an absolute distinction between relapses and true sequelæ was impossible. We must also remember that we knew little of the immunity conferred by an attack. Dr. Riddoch's case might have been, perhaps, an instance of two separate attacks occurring in the same person. When he referred to psychotherapy as an aid to treatment in the disease, he meant that one should ascertain what were the patient's own hopes and fears about his illness, and endeavour to allay needless anxieties. Having achieved this, one was in a much better position to carry out physio-therapy successfully. With regard to the pathological report of Dr. McAlpine, he thought that a calcified vessel, however wide its lumen, must be considered inadequate to provide a proper circulation.

Friday, July 27th.

At the closing session, Dr. G. **Riddoch** being in the chair, a discussion on the

Prognosis of Psychoses During Adolescence

was introduced by Dr. D. K. **Henderson** (Glasgow). In order, he said, to keep the discussion within limits, he would formulate his views as to prognosis, especially in regard to the type of mental reactions ordinarily called the dementia præcox type. Nothing was more tragic than the occurrence of mental disorder at the time of adolescence. Unfortunately disorders of conduct were often glossed over by the parents, and thus the opportunity for preventive treatment was lost.

The attitude which we adopted with regard to prognosis in general must be largely based upon the views we held concerning the mechanism of the disorder. We could either regard cases as developing upon the basis of some kind of organic visceral disease, or we could utilise the broader conception of psychobiological adjustment. Kraepelin's classification differentiating the manic-depressive and dementia præcox groups had been valuable as a stimulus to careful observation of symptoms, but in the opinion of the speaker symptoms alone were an unsafe basis for prognosis. The setting in which they occurred had also to be considered. Kraepelin's conception tended to breed pessimism in that it encouraged the idea that certain symptoms were characteristic of dementia præcox, and this carried with it a hopeless prognosis. In 1911 Bleuler had coined the term schizophrenia to include all cases except the manic-depressive group. This group of Bleuler's was a wide one, and according to his figures only 22 per cent. of the cases showed a severe degree of deterioration, but in the others there was always some residual defect. McCarthy had lately divided the cases of the dementia præcox types into two groups: (1) degenerative, and (2) non-degenerative; the latter, curable, group was subdivided according to the supposed toxic or infective factors in the ætiology. Cotton and his co-workers had been working on much the same principles, and had laid great stress upon the importance of focal infection, reporting a high percentage of recoveries as the result of treatment on these lines. He believed, however, that a wider conception was necessary. Although the possibilities of focal infection and of endocrine disturbances must be kept in mind, we must also estimate the psychic factors at their proper value, and consider the personality as a whole. The work of Freud and Jung had provided a great stimulus to research on these lines. He also wished to draw particular attention to the work of Meyer, who first emphasised the importance of considering mental illness in terms not of clean-cut groups but of reaction types. If we acted upon this conception we need not hesitate to diagnose a patient as belonging to the dementia præcox type of reaction; it did not follow necessarily that the prognosis was hopeless. He quoted in detail two cases illustrating the value of this method of approach to individual cases. One had to recognise in these cases both the constitutional defect and the good potentialities which might be developed and enable the individual to react to the illness in a satisfactory manner. Four other cases were related in which individuals showed symptoms, which might, in themselves, have been regarded as carrying a grave prognosis, but who nevertheless made good recoveries. When one considered these cases as individual problems in the light of the psychobiological conception, the recovery in each instance was intelligible. During the war he had reported a group of cases, which he termed the dementia præcox type of reaction occurring in soldiers, and pointed out that, as a rule, they reacted quickly to treatment and made good adjustments. This was due to the fact that the stress of war environment brought symptoms to the surface at an earlier period than would have occurred in civil life.

He attached great importance to occupational treatment in such cases. By this means outside interests might be so far developed that patients would learn to keep themselves in hand, and although they might not gain a complete insight into the actual nature of their illness, they might make a satisfactory social adjustment. There was no doubt, in his opinion, that if cases came under observation and treatment early the prognosis was very much better than it otherwise would be. The trend of public opinion was in that direction. More psychiatric clinics and out-patient departments were being established, and he believed that this would gradually lead to a more hopeful view in regard to the prognosis in these cases of so-called functional brain disorder.

Sir **Frederick Mott** (London) said that although he personally had devoted more attention to the neuropathological side of the subject under discussion, he was equally interested in its psychogenic aspect. Every case was a separate biological problem, and we should avoid attempts at rigid classification. The individual constitution should be carefully considered as well as the environmental stress. There were people whom one could knock on the head, fill up with alcohol, or give them syphilis, and they would never develop insanity. There were others who would readily break down under any one of these stresses. In this connexion he referred to the work of Gordon on similar and dissimilar twins, which demonstrated conclusively the importance of the constitutional factor. He had, however, for some time been interested in atrophic changes which he had observed in the genital glands in cases of dementia præcox. He quoted the case of a young man who died in hospital a month after a gunshot wound of the brain. He had originally taken the testes from this case as part of his control material. He was surprised, however, to find atrophic changes. Inquiry showed that the death had almost certainly been due to suicide. Some time later he had the opportunity to see a brother of this man in an asylum. After his death he found exactly similar changes in the testes. He subsequently discovered that there was a sister also in an asylum, that the father had died insane, and that there was insanity also in the mother's family. Here was an example of genetic inadequacy.

The war had illustrated the importance of the environmental factor, and had brought a number of cases of potential dementia præcox to the surface. Perhaps this might have been prevented by a more careful examination of recruits. He had found in these cases of dementia præcox, in the interstitial cells of the testes, in the adrenals, and the pituitary, disorderly arrangement and deficient staining of the nuclei. He next turned his attention to the nerve cells and in cases of dementia præcox found a deficiency of chromatin. As to the treatment of these cases by sheltering them from environmental stress—was this a good thing for the race? His studies of heredity in these cases had shown him that anticipation occurred in successive generations, and that in this way nature attempted to get rid of a defective stock.

Dr. F. E. STOKES (Portsmouth) presented statistics from the Borough Mental Hospital of Portsmouth relating to the recovery-rate in cases of adolescent insanity. These figures covered the post-war period. The male recovery-rate proved higher than the female by 10 per cent. As a fair proportion of the males were soldiers, this discrepancy appeared to be explicable in the light of the importance played by exogenous factors in precipating the disease.

Dr. DEVINE thought that psychiatrists owed a great debt to the inspiration of August Hoch. In each case it was necessary to study the individual reaction type, which was the soil upon which the psychosis grew. If we found that a psychosis had developed upon the basis of a shut-in personality as a practical matter we could be fairly sure that the prognosis was a bad one. He agreed with Dr. Henderson as to the important part played by war stress in the development of dementia præcox-like symptoms in the soldier. His experience with civilian cases had been similar. If the onset of the disease had been sudden and the precipating causes adequate the prognosis was good. He referred to the case of a young woman, whose history, so far as he could ascertain at the time, was that of a normal individual. The story of the onset was that in some amateur theatricals she had to take the part of a man. This brought to the surface a latent homosexual trend, which developed into the fantastic belief that she was a man. Here he felt that the prognosis was good, but in point of fact she became worse and had shown no signs of recovery. However, when he went deeper into the history he found that the girl had in reality been suffering from hallucinations for some years before the final collapse.

Another case to which he referred was that of an only son with a strong mother-fixation, who had failed to adapt to war stress. Judged by the symptoms, which were those of a confused dementia-præcox-like state, prognosis appeared bad. However, the patient eventually left hospital and became married to a woman much older than himself. This situation provided him with a partner who was prepared to fuss over him and demand little demonstrative affection in return, and at the same time the age of his wife was an effective barrier to the responsibilities which would have been entailed by a family. Under these circumstances he remained well.

Dr. SYMONDS, in discussing the fact that patients often fail to come within the range of proper treatment until the stage for preventive treatment is passed, agreed with Dr. Henderson that this was due largely to ignorance of the public, who either overlooked peculiarities of conduct, or took refuge in the blessed excuse of "nerves." The fault, however, was not wholly with the layman ; the average medical student in his curriculum had little or no chance of gaining any practical experience of mental disorders. He therefore often went into practice feeling that the psychiatrist alone was competent to deal with such cases—hence the regrettable tendency even in the medical profession to encourage the hypothesis of "nerves."

The remedy for this defect in the system of medical education lay in the provision of observation wards for mental cases in the general teaching hospitals. The very fact of the existence of such wards would make the student realise that the treatment of mental disease was an integral part of medical practice. The student would have the opportunity of learning to handle these cases and think about them from a common-sense standpoint. The hospital patient also would be encouraged to find help for the solution of his problems outside the walls of a mental institution. These patients did in fact attend the out-patient departments of general hospitals in large numbers, but in London at any rate facilities for their treatment as in-patients was sadly lacking.

In the future treatment of these cases he felt that closer coöperation was needed between the psychiatrist and the general practitioner. This, he thought, would come when the practitioner had an opportunity of practical experience in this work as a student, and when pyschiatrists in general learned to talk about their subject as intelligibly as Dr. Henderson had done. For hospital cases much more might be done in the way of after-care by means of a properly organised social service.

Dr. J. L. JACKSON (Fareham) hoped that Dr. Henderson in his reply would say something more about the treatment of these cases. As medical superintendent of a county asylum, he himself was in charge of 1100 patients, and with a limited staff felt keenly the difficulty in providing adequate treatment. Psychiatry had tended to become divorced from general medicine, and he welcomed every opportunity of bridging this gap. He was glad that Dr. Henderson had mentioned the possibility of a social recovery as opposed to mental recovery. There was no doubt that a good many patients were able to make a more or less satisfactory adjustment to the social environment even if they lacked insight. He regarded occupational therapy as one of the most important means of treatment. At the institution where he worked he had organised games and amusement committees with most satisfactory results.

Dr. D. STONE (Northampton) referred to the large number of cases which he encountered in general practice which never came within the ken of the specialist. Unfortunately, there was no specific remedy for mental disorders. Of what value was it to consult a text-book upon, say, psychasthenia ? The individual case had to be studied on its own merits. One had to find out what were the latent interests of the individual and develop them so far as possible in relation to his environment. He quoted the case of a young man who had failed to adapt himself to the requirements of business life, into which he had been launched by his parents. He had frequently expressed a desire to go to sea, which had been suppressed. Finally he was allowed to follow his own bent, went to sea on a whaler, and became an expert harpoonist of considerable renown.

Dr. H. BAIRD (Hastings) thought that it would be impracticable to undertake the treatment of mental patients in a general hospital. He considered the average duration of stay and the difficulty of caring for excited cases serious objections. The proper place for the mental patient was the local mental hospital. He thought that more use might be made of these hospitals for the purposes of teaching.

Dr. D. MATTHEW (Exeter) had been much interested in the effect of occupational therapy and exercise in preventing the development of catatonic conditions in dementia præcox cases. Other speakers had stressed the importance of the environmental factor in cases of mental disease. He thought much might be done also in some instances by means of psycho-analysis to change the patient's mental attitude.

Dr. RIDDOCH strongly supported the view that the establishment of mental observation wards in the general teaching hospitals was essential if the medical practitioner were to gain a clearer understanding of the problems of mental disease. Dr. Baird had said that provision was already made for the teaching of psychiatry at existing mental hospitals. Unfortunately the medical student, as a rule, was in the habit of regarding the demonstrations held in such hospitals rather as a spectacle in which he might take a detached interest than as an opportunity for gaining any real insight into the problems involved. If he were to learn anything of real value about these cases he must be given more responsibility and better opportunities of practical experience. As to the importance of the environmental factor, especially in the after-treatment of mental cases, how far might not the State be considered responsible for the after-care of mental patients, as well as their temporary shelter in asylums ? He thought that the after-care was equally important. He was especially interested in Dr. Henderson's remarks about the possibility of social recovery with lack of insight which he had so clearly illustrated in his cases.

Dr. HENDERSON, in his reply, said that he was encouraged to think that interest in these problems was growing. He thought the education of the student in psychiatry a matter of great importance. At Glasgow an out-patient clinic had lately been established where the student was taught to observe the social aspects of mental illness. The fault of the older psychiatric teaching had been that, although it presented the student with a vivid symptom-picture, it did not safely stress the importance of the history. In cases of mental disorder the history was just as important as in any other disease. Before considering prognosis or treatment one must know the facts.

With regard to treatment, he had been much impressed by his experience in the U.S.A. of the good results obtained by occupational therapy. This must be organised on a satisfactory basis if it were to be of any use. At the hospital where he worked he had recently succeeded in obtaining the services of an occupational instructor, and the scheme had already proved so successful that he had added to this important branch of his staff. He now had over 100 patients engaged every morning at one of four different kinds of handicraft. The result was that patients who had been in hospital for years and had sat about doing nothing were now getting satisfaction out of their work. The wards were easier to manage, and there was less demand for sedative drugs and for restraint. In allowing these patients to have in their possession tools such as might be used for weapons, one must be prepared to take reasonable risks.

He thought that mental hospitals should have the benefit of a consulting staff of medical and surgical specialists in order to preserve the perspective of the psychiatric staff and keep them in touch with the advances of general medicine. In connexion with the after-care of these patients, out-patient work had not yet been sufficiently developed. It should be possible for each one of these cases to have access in time of need to some physician upon whom he knew he could depend for sympathy and understanding.

Corrigendum.—In the report of Dr. E. P. Poulton's remarks on the relation of acidosis to rickets, at the Section of Diseases of Children (THE LANCET, August 18th, p. 361), the work carried out at Guy's Hospital was done by Drs. Osman and *Burgess*, and not as stated. We regret the error.

SUSSEX PROVIDENT SCHEME.—The question of the administration of the Sussex Provident Scheme has recently been discussed at length by the medical profession of the county. It was decided that as the scheme was supported by three parties—the subscribers, the doctors who gave their services free, and the lay representatives of the hospitals—the medical profession should be represented on the committee of the scheme and should elect their own representatives. The matter has arisen in consequence of the proposals put forward by the Royal Sussex County Hospital for the formation of a contributory arrangement to extend the facilities of the scheme by adopting a system of mass contributions of 2*d.* a week, instead of 3*d.*, from persons in receipt of less than 40*s.* a week. The majority of the hospitals consulted on the matter have accepted the proposals necessitating a change in the constitution of the executive committee to carry on the new régime. At a meeting of representatives of bodies coöperating with the scheme at Brighton on August 13th, it was decided that each hospital coöperating be asked to nominate two members for election to serve on the committee, one member, a medical man, to be nominated by the hon. medical staff of each hospital, and one member, a layman, to be nominated by the committee of management of the hospital, the subscribers to the provident scheme to elect from such nominees two medical men and two laymen. Although this was declared to have been carried unanimously, Dr. L. A. Parry, as representing 400 doctors in Sussex, said that while he could not possibly accept the resolution on behalf of the medical profession, he would do his best to get them to accept it as a compromise.

Reviews and Notices of Books.

BIOMATHEMATICS.

Being the Principles of Mathematics for Students of Biological Science. By W. M. FELDMAN, M.D., B.S. Lond., F.R.S. Edin. With an Introduction by Sir WILLIAM M. BAYLISS, D.Sc, F.R.S. London: Charles Griffin and Co. 1923. Pp. 398. 21*s.*

AN experienced reviewer of medical literature into whose hands Dr. Feldman's book came inquired whether "all medical students nowadays have to know mathematics of that kind?" If by student we are to understand those technically *in statu pupillari*, the answer is a decided negative. It will be long enough before even the simplest differential equation finds a place in a paper set for an honours M.D. Hard as are the hearts of the Board of Examiners for the Primary F.R.C.S., the calculation of the effective component of the biceps will never reduce still further the attenuated ranks of those who satisfy the Board. But if by student we mean someone verily *studiosus*, a seeker of knowledge rather than diplomas, the negative is much less decided. In his introduction to Dr. Feldman's book, Sir William Bayliss indicates wide ranges of knowledge access to which is not easy to him who knows some algebra, but is impossible to any other. Turn where we will, to biochemistry, to epidemiology, to ophthalmic medicine and surgery, to general physiology, we are sooner or later confronted with the language of the mathematician; the student *must* learn the grammar of that language. But—and the distinction is a highly important one—this is not the same thing as saying that the medical student must be a mathematician. If that were essential, the outlook would be desperate, because mathematicians are certainly as rare as poets.

To one of these, Dr. Feldman's definition of mathematics as "the science and art of rapid and accurate computation"—Dr. Feldman admits it to be incomplete and might have used a stronger qualification—would be provocative of angry mirth. We shall be fortunate if once in a century one of these rare spirits, such a one as Hermann v. Helmholtz, devotes himself to the advancement of medical science. But although study of X.'s "French in three months without a master" will not turn a man into a serious rival of Anatole France, it will open to him a new world. Dr. Feldman has attempted to cut a track into a still more fascinating world, and, in our opinion, has attained a very creditable measure of success. He has several competitors, but none, except perhaps Salpeter—whose book besides being in German is too difficult for English medical students—has covered so wide a field. The amount of previous knowledge assumed is trivial, every method described is illustrated by a really interesting example and full use is made of diagrams. Anyone who has read the book carefully will not only be able to understand the language of more than nine-tenths of medico-mathematical papers, but will be in a position to continue his study of some particular branch of mathematics relevant to his own line of investigation. Dr. Feldman's sections on differentials and differential equations seem to us especially good, although the somewhat perplexing idea of partial and total differentials would have been made easier to follow with the help of a diagram, and the chapter on "Mathematical Analysis Applied to the Coördination of Experimental Results" is very helpful. The reader must of course never forget that although the successful representation of experimental results by a mathematical formula is a necessary condition of the latter's validity, it is not a sufficient condition. Observations may be, and often are, very effectively smoothed by a function which cannot possibly be regarded as the "law" of the phenomenon.

The chapter on "Biometrics" is not the best in the book; it is avowedly based upon a text-book written for students with a wider knowledge of algebra than readers of Dr. Feldman's manual will generally command, so that undue emphasis is given to methods and results of more interest to mathematicians than to experimental workers. But this defect is the less important because Yule's treatise on statistics is available to all. Dr. Feldman richly deserves the gratitude of the medical reader, and we hope that his book will be widely studied.

Inborn Errors of Metabolism.

Second edition. By Archibald E. Garrod, K.C.M.G., D.M., LL.D., F.R.S., F.R.C.P., Regius Professor of Medicine in the University of Oxford; Consulting Physician to St. Bartholomew's Hospital and to the Hospital for Sick Children. Oxford Medical Publications. London: Henry Frowde and Hodder and Stoughton. 1923. Pp. 213. 7*s.* 6*d.*

Prof. Garrod's book is too well known to need introduction. Originally published in 1909 as the author's Croonian Lectures, delivered before the Royal College of Physicians in 1908, the volume was an immediate success, and it is quite safe to say that the second edition will have a similar popularity. The author confines himself to six "errors"—namely, albinism, alcaptonuria, cystinuria, hæmatoporphyria congenita, congenital steatorrhœa, and pentosuria. In the first chapter he deals with the chemistry of the species, pointing out that the metabolic processes are always the same for any given animal and that they always breed true except in cases showing an inborn error. He corrects the prevalent idea that if any abnormal substance is produced through a faulty metabolism, a new process is evolved to metabolise it. Study of the inborn errors of metabolism proves that this is not the case, since the abnormal substance is excreted unchanged. Alcaptonuria and cystinuria are examples of this. The second chapter is devoted to a statistical study of the rate of incidence of these rare diseases. The chapters dealing with hæmatoporphyria and steatorrhœa are entirely new; these two congenital diseases, although rare, are none the less interesting. The other chapters have been extended and brought up to date.

Throughout the book the author develops the idea that all the inborn errors have a common basis in their ætiology—namely, the lack of some ferment which is present in the normal body. Research in metabolism has shown that each step in the utilisation of substances such as proteins, fats, or carbohydrates is accomplished in stages, with an enzyme responsible for each chemical reaction involved. In some cases the enzyme is non-specific, acting equally well for, let us say, the oxidation of one oxy acid as another, but in the majority of reactions it becomes apparent that the ferments are specific to each. Prof. Gowland Hopkins's work on glutathione demonstrates very beautifully the importance of these tissue enzymes. All the inborn errors of metabolism can be explained on the assumption that some particular enzyme which normally destroys the abnormal substance in question is lacking in that particular patient. All workers appear to be agreed that cystinuria and alcaptonuria are due to the lack of the specific ferment responsible for the oxidation of these substances, but in the case of albinism there seems to be some difference in opinion. Thus Karl Pearson, Nettleship, and Usher suggest that melanin may not reach the pigment cells or that they have lost the power of storing the pigment. But, as Prof. Garrod points out, what is more likely than that this lack of the power of storing melanin is passed on by the gametes through the medium of the absence of a ferment. Moreover, the experimental work of Bloch and others demonstrates clearly that the absence of an enzyme is the best explanation of albinism. The inclusion of congenital steatorrhœa as one of the inborn errors of metabolism will occasion some surprise. Somehow or other one has not been in the habit of regarding this rare disease as belonging to this category, yet after reading the author's account of it one feels that it is quite just. Congenital steatorrhœa possesses all the essential attributes of an inborn error. The author allots the blame to the pancreas, attributing the disease to the lack of some unknown enzyme of the pancreatic juice which is essential to the digestion and absorption of fats. No substantial evidence of pancreatic disease in this condition has yet been obtained, but Prof. Garrod's explanation fits the facts very nicely.

The volume is written in a lucid manner and, unlike most treatises on metabolism, can be read and understood by most of us. Though the diseases described are so rare that they do not enter into practical medicine, the book will be read by the student of metabolism because of the light these pathological processes throw on normal metabolism, and by the medical man, because of the fascinating way in which the author deals with his subject.

The Debt of Medicine to the Fine Arts.

By J. A. Nixon, C.M.G., M.D. Cantab., F.R.C.P. Bristol: J. W. Arrowsmith. 1923. Pp. 29. 2*s.* 6*d.*

This little book is a reprint of the presidential address delivered last autumn at the opening of the fiftieth session of the Bristol Medico-Chirurgical Society. In it Dr. Nixon records in a pleasant fashion the many debts which medicine owes to the fine arts from the times of ancient Greece downwards. His argument is that the artistic sense is an aid to medicine, not only directly, as in the case of the beautiful anatomical studies of Leonardo and in Caspar's plates to Vesalius's anatomy, but also indirectly, as, for instance, that Hippocrates was inspired to draw his effective pictures of diseased conditions by the artistic sense of the age in which he lived. For a man to be able to put down upon paper an accurate picture of what he sees means that he can memorise or have a mental image of what he sees, and he quotes Paget, himself no mean draughtsman, who says of the power of drawing, "It helped to enable me to look and see more in things than some could see." We rather wonder that Dr. Nixon did not mention three medical men who made a reputation as artists, two of whom are dead—namely, Prescott Hewitt and Seymour Haden—and one alive, Henry Tonks.

Effects of Light on Life.

Grundzüge der Lichtbiologie und Lichtpathologie. By Prof. Walther Hausmann. (Eighth supplementary volume to "Strahlentherapie.") Berlin and Vienna: Urban and Schwarzenberg. 1923. Pp. 230. 15 pre-war marks.

Prof. Hausmann brings together, within the compass of a book of 230 pages, all that is known regarding the influence of light upon living organisms. Such a book gains much in value when, as in this case, the author is one of those who have contributed materially to our knowledge of the matters of which it treats. Prof. Hausmann's attitude is judicial throughout the work, and the many difficulties met with in the interpretation of the results of observation and experiment are by no means minimised. Sometimes, indeed, we may even feel that his caution is excessive.

Of the 12 chapters into which the book is divided, the first nine treat of the physiological aspects of the subject; the relations of photochemistry to photobiology; the general effects of light upon living organisms, and its more special influence upon the growth and movements of plants and animals. The action of light upon the superficial and deep tissues of man and the higher animals is discussed, and the part played by surface pigmentation in protecting the underlying structures. The chapters which deal with the production of disease by light are of special interest. In normal organisms these effects are very limited, but certain chemical substances, and especially fluorescent pigments, have the property of rendering the tissues highly photo-sensitive. Thus eosine administered for considerable periods for the treatment of epilepsy is capable, as Prime has shown, of rendering a patient subject to grave lesions of the skin and nails when he is exposed to bright sunlight; and domesticated animals which have been fed upon vegetable foods containing exogenous sensitising agents, such as buckwheat or Swedish clover, are liable to develop lesions of the skin and hoofs, and the diseases so induced are not infrequently fatal. Only unpigmented animals suffer severely, but piebald animals develop an affection of the skin of the unpigmented areas of skin.

The only disease known to result from the presence in the tissues of an endogenous photo-sensitising agent is hydroa vacciniforme, which is, in not a few cases, associated with porphyrinuria, and especially with congenital porphyrinuria. It was the author himself who showed that hæmatoporphyrin has a powerful photo-sensitising action upon lowly forms of life, and also upon white mice. After injection of hæmatoporphyrin the mice die quickly if exposed to bright light; in subdued light they develop a chronic light disease, whereas if kept in the dark they do not suffer any harm. Prof. Hausmann gives an excellent discussion of this subject, and of certain difficulties which it presents. Other human maladies in which light is apparently an exciting or modifying cause, but in which the photo-sensitising agent is unknown, are also discussed. A chapter is devoted to the fatal effects of light upon sensitive animal and vegetable organisms, and the concluding chapter of the book deals with the therapeutic action of light upon tuberculous lesions.

In compiling this book Prof. Hausmann has done a great service to physiologists and pathologists alike.

MICRO-BIOLOGY.

Handbuch der mikrobiologischen Technik. Band I., 2 Hälfte. 3 und 4 Abteilung.: Nährboden und Züchtung. By Prof. Dr. RUDOLF KRAUS, Direktor des Serotherapeutischen Institutes in Butantan-San Paolo (Brasilien), und Prof. Dr. PAUL UHLENHUTH, Geh. Rat., Direktor des Institutes für Experiment. Therapie Emil v. Behring in Marburg a.d. Lahn. Berlin u. Wien: Urban und Schwarzenberg. 1923. Pp. 535–817.

THE two sections which are here under consideration constitute the second part of the first volume of this book, which will be complete in two volumes. The present part has been written in seven chapters by different well-known authors: E. Gildermeister, W. Nöller, W. v. Drigalski, R. Doerr, E. Ungermann, E. Küster, M. Neisser, and K. Beckey, each of whom provides a separate part. The whole work is, no doubt, intended to provide an up-to-date treatise comparable to the second and third volumes of Kolle and Wassermann's handbook. The text, if not quite so comprehensive, is, on the whole, more readable, and appears to have been more critically compiled than in the latter exhaustive work. Sections 3 and 4 treat of the more generally applicable kinds of culture-media and the technique of aerobic methods. Anaerobic technique and some special methods of culture will, no doubt, find place in the second volume. Several of the procedures for renovating used culture-media, which came into use during the war for the sake of economy, are given in detail. The technique for the cultivation of protozoa is well dealt with in nearly 40 pages by Nöller. The complete work promises to be a most useful book of reference. A list of the authors quoted is given at the end of each article, including the full titles of the papers.

HANDBOOK OF PHYSIOLOGY.

Sixteenth edition. By W. D. HALLIBURTON, M.D., LL.D., F.R.C.P., F.R.S., Professor of Physiology, King's College, London. London: John Murray. 1923. Pp. 968. 21*s.*

THERE is certainly no living British physiologist to whom this book was not familiar (either under its present title or as Kirkes's Handbook) as an established text-book in his earlier student days, and Mascagni's anxious figure displaying his lymphatics (now Fig. 194), or Bourgery's contemplative fellow showing his cerebro-spinal axis (Fig. 160) draw forth a sigh as we recall the time when we first bent over them. Although for three-quarters of a century this, our first guide, and best of students' text-books, has appeared in edition after edition, each has been better than the last. The present editor has himself seen through the press 16 out of the 28 editions since the book appeared in 1848, and will, we hope, give us more, for the improvements in the present edition are such as to bring the book right up to date and ensure its continued popularity. One pleasing addition to a book which has given shelter to many a passing theory in the course of the wonderful development which physiology has undergone, is the inclusion of portraits of some great physiologists of the past, two of whom, Ludwig and Claude Bernard, were still living in the early days of Kirkes's Handbook.

Excellent balance is maintained in this book between histological, chemical, and experimental physiology, and in these days of specialisation the student can still obtain a proper perspective from the reading of it to counteract, if need be, the oral instruction which they receive. We believe that this book which already extends a respectable distance into the past of British physiology will continue its advance, abreast of the subject, well into the future.

JOURNALS.

QUARTERLY JOURNAL OF MEDICINE.—The July number contains the following articles: The Fixation of the Kidney, by A. H. Southam. The investigation described in this thesis was undertaken with a view of throwing further light upon the causation of displacements of the kidney. The perirenal fascia was studied by means of sections of the trunk of six fœtuses and seven adult bodies. Plaster casts of the renal fossæ were taken in other cases. The nature of the perirenal tissue was determined by histological sections. A complete fascial sheath was convincingly demonstrated enclosing the kidney, suprarenal and perirenal fat, and attached to the diaphragm, vertebræ, and transverse fascia. The pararenal fat lies behind this fascia, and is probably the site of origin of a perinephric abscess. The perirenal fascia is the greatest factor in maintaining the position of the kidney, for all its other attachments can be divided without affecting the mobility of the organ to any material degree. The perirenal fat is not of great importance, but it serves chiefly as a protection from injury. Little fat is present in young children. The intra-abdominal pressure is the second most important factor in the maintenance of the kidney in position. Movable kidney is much more common in women; this is due to the widening of the pelvis, which causes an alteration in the shape of the renal fossa. In the male the renal fossa is pear-shaped and narrow at its lower end, but in the female it is cylindrical and widens below. Additional factors in women are lack of muscle tone and the effects of pregnancy. The article is illustrated by three plates, which show clearly the various points made by the author.—Endocarditis Lenta (Chronic Ulcerative Endocarditis): A Note on Thirty Cases seen in Civil Practice since the War, by Carey F. Coombs. The most striking features in this series of cases are the high sex-incidence in the male, the frequency with which the aortic valves alone are affected, and the fact that the men attacked were, with one exception, of fine physique, good previous health, and had all undergone hard and prolonged war service. The author considers that there is evidence that fatigue is the most constant causal factor, and it is possible that the production of lactic acid in the muscles may increase the rate of growth of organisms of low virulence. This is in accordance with Walker Hall's recent bacteriological investigations. A plate is included showing the lesions as they affect the aortic valve.—A Clinical Investigation into the Relationship of the Fat-Soluble "A" Vitamin to the Ætiology of Rickets, by Douglas Galbraith. Another blow is here dealt at the vitamin theory of rickets. The investigation is clinical, children and not animals being studied. Severe rickets was found to occur in Glasgow in children with normal amounts of fat in their dietary, and the percentage of rickets in summer and in winter was lower in those on a fat-poor than in those on a fat-rich diet. In the summer spontaneous healing was seen, even when the children were fed upon a fat-poor diet. In the winter violet rays and massage proved the most successful therapeutic agents. The X-ray appearances of the bones in varying stages are well seen in the plates accompanying the article.—On the Phosphorus and Calcium of the Blood in Renal Disease, by O. L. V. de Wesselow. The inorganic constituents of the blood in renal disease were estimated, with a view to correlating changes in their amounts with variations in clinical symptoms. Seventy-four patients were investigated, including cases of nephritis, albuminuria of pregnancy, and a few of surgical affections of the urinary tract and cardio-vascular disease. The conclusions arrived at are that in cases of nephritis in which the prognosis is grave there is a marked retention of phosphates, and on the whole phosphate and urea excretion run parallel. The calcium content of the serum varies inversely with the phosphates, and a low calcium blood figure seems to be associated with the local muscular twitching in the late stages of uræmia.—A Comparative Study of Basal Metabolism in Normal Men, by Frederick Greig Hobson. There are many fundamental factors which influence the basal metabolic-rate, and the author has endeavoured to determine their relative importance in order to establish a normal base line for metabolism. The factor which varies most in the different methods for estimating basal metabolism is body size, as this has been calculated according to different formulæ. The author, as the result of observations on a large number of healthy individuals, considers that Dreyer's formula, using the calculated body weight instead of the observed body weight, gives very satisfactory results. The Benedict clinical calorimeter was used throughout, and certain defects are noted, and the methods adopted for their correction are described.—Critical Review. Jaundice: A Review of Recent Work, by J. W. McNee. This article opens with a reference to the important advances which have been made during the last ten years in America, France, Germany, and Holland, and which have revolutionised our views on the pathology of jaundice. A diagrammatic representation of a liver lobule is given as a basis for the new theory of jaundice which is detailed. The importance of Aschoff's "reticulo-endothelial system" is outlined, and the advances made possible by the van den Bergh test are described. For clinical instruction jaundice is classified as follows: (1) Obstructive hepatic, (2) toxic and infective hepatic, and (3) hæmolytic. In addition to an account of the technique employed in the van den Bergh test the article closes with a note on the "dissociated jaundice" of the French observers, in which it is claimed that in certain cases of hepatic disorders bilirubin alone may be retained in or reabsorbed into the blood, while the bile salts are excreted normally, or the reverse process may occur.

British Journal of Ophthalmology. July and August, 1923.—In the July issue J. B. Lawford and Humphrey Neame write on Binocular Choroidal Tuberculosis with Detachment of the Retina in two kittens, recording a probably unique observation. The kittens were of the same litter. In one case the presence of the tubercle bacillus was demonstrated in the affected choroid of one eye. In the other it was demonstrated not only in the eye but in various other organs and inoculation of a guinea-pig gave a positive result.—R. R. James has unearthed various cases of ophthalmological interest from the post-mortem records of St. George's Hospital.—A paper by the late Charles Killick tabulates 100 cases of cataract removed under a conjunctival bridge.——The August issue contains, besides an appreciation of the late George Critchett (1817–1882) in the "British Masters of Ophthalmology" series, by A. Maitland Ramsay, a paper by Miss Ida C. Mann on the Embryology of Congenital Crescents. These may occur in any part of the disc margin, but two-thirds of them are found below the disc and only a small proportion on the outer side, a fact which differentiates them from the acquired crescents of myopia. In the common form of congenital crescent the retinal pigment epithelium and also the nuclear layers have failed to reach the lower end of the nerve, so that a small area devoid of every layer except nerve-fibres is interpolated between the lower edge of the disc and the true lower edge of the nerve. The embryological cause of this is a slightly abnormal development of the choroidal fissure. This is explained by reference to the embryology of birds.—Also a communication (received through the Ministry of Health) from Gordon Norrie, who is doctor to the Copenhagen Royal Blind Institute, in which practically all blind children in Denmark are educated. Since 1900 it has been compulsory for every midwife to instil a solution of nitrate of silver, 1 : 150, into the eyes of the infant after birth. The result has been that blindness from ophthalmia neonatorum is almost eliminated in Denmark.

American Journal of Ophthalmology. May and June, 1923.—In the May issue: Iridotasis Operation for Glaucoma, by M. Goldenburg. This is the description of an operation similar to that of Colonel Herbert for effecting drainage by the inclusion of the iris in the scar. The author has practised the operation for five years with success.—N. Yoshida, of Japan, reports a case of acute glaucoma following Heine's cyclodialysis, an operation devised, but hardly practised in this country, for the cure of chronic glaucoma.—J. M. Thorington, by means of a single letter, a V, and a movable screen, claims to have devised a test for visual acuity superior to the ordinary test cards.—A. E. Foster reviews the literature of corneal grafting and adds some original experiments on cats, from which he concludes that a flap of the entire thickness of the cornea can be removed and replaced with an entirely satisfactory result, but that a transplantation from another species is a biologic impossibility.—In a statistical study of ophthalmia neonatorum in Philadelphia, L. Lehrfeld states that one instillation of any prophylactic is not a positive protection against the disease, and that a large proportion of the new-born do not receive any prophylactic at all. Blindness from this cause has not been materially reduced by the present methods of prevention, he says, and he advocates more stringent measures, including the use of argyrol in 25 per cent. solution on three successive days.——In the June issue H. D. Lamb reports two cases of ruptured choroid, illustrated by a plate. One of them is of unusual extent and shape.—C. E. Farree and G. Rand contribute a paper showing the influence of illumination on the size and form of the colour fields. The charts show how little dependence can be placed on breadth or shape of field and order of ranking as to breadth, either in diagnosis or in checking up the advance or recession of a pathologic condition, unless greater precautions are taken for the control of the intensity of the stimulus light than are possible in the conditions which ordinarily prevail in office and clinic work.—Two articles give instances of focal infection from teeth and tonsils. The first, by Clarence P. Jones, relates a very unusual case of interstitial keratitis, apparently of the typical syphilitic variety, but in which syphilis was excluded. It began to clear up at once on the removal of nine teeth with apical abscesses and also infected tonsils. The second article, by John Dunn, gives further instances of various ocular conditions due to focal infection. In two of them the removal of an old blind eye proved an effective remedy.—Of the remaining articles the most important is one by W. H. Nardin and R. S. Cunningham on familial retino-cerebral degeneration, which was annotated in our issue of August 18th.

THE LANCET.

LONDON: SATURDAY, SEPTEMBER 1, 1923.

POST-HOLIDAY LASSITUDE.

THAT it is not unusual for the worker of the modern city type to return from a long-expected holiday feeling rather more tired and worn-out than when he started is a matter of sufficiently common experience to have rendered it almost a truism that it requires a week to recover from a holiday. The point was well illustrated some time ago by Mr. HASELDEN in one of his trenchant cartoons, where he depicted the holiday-maker back from a period of unaccustomed swimming, tennis, and long tramps, wondering why he failed to feel recuperated. The cartoon served as an apt illustration of one aspect of the puzzling problem, what constitutes "form" and its absence. Apart from the body of purely empirical knowledge accumulated by generation upon generation of trainers both of men and of animals, there has, up to the present, been a very meagre understanding of the factors which go to make up this condition of "form." It is common knowledge that an amount of exercise which, indulged in immediately after a long period of sedentary existence, will produce nothing but exhaustion with its deleterious results, may be accomplished readily and easily, leaving its performer fitter than before, if led up to by a period of gradually increasing daily exercise. The application of this knowledge constitutes "training."

The factors underlying the acquisition of form—improvement in coördination, hypertrophy of muscles, speeding-up of the mechanism for the removal of metabolites—are not altogether unknown. Little attention has, however, been paid to the why and wherefore of the deleterious effects of heavy and unaccustomed exercise in untrained individuals. Some light is thrown upon this subject by observations recently made by an American worker, Dr. G. O. BROUN.[1] Using dogs as his subjects, this observer has obtained evidence to the effect that several days of hard muscular effort, following upon months of sedentary life, result in a pronounced destruction of the red cells of the blood; similar effort indulged in by animals which had been leading an open-air life with plenty of exercise, on the other hand, had no such effect. The dogs used in the experiments had been kept caged for several months, the cage in this instance serving as an excellent representation of the office of the city worker. They had been fed upon a "generous mixed diet containing considerable meat," in which again the parallelism with the conditions of the city worker is very evident. They were then exercised for several successive days upon a treadmill, the exercise being conducted for four hours daily, in spells of two hours with an interval of one hour. During one day's exercise they averaged a journey of about four miles at an inclination of 20°, or the equivalent to an ascent of something over a mile. It is recorded that in the early days of the experiment the dogs appeared very tired, but that by the end they showed all the signs of thorough enjoyment. Examinations of the blood as to the total volume of corpuscles by the hæmatocrit method and of the plasma by the vital-red procedure were made at frequent intervals before, during, and after the period of exercise. The findings showed a remarkable conformity; in every instance there was a marked decrease in the total corpuscular volume with a less marked increase in the plasma volume. After an average of a week's exercise, Dr. BROUN found that it took from one to three weeks for the corpuscular volume to return to its previous level. Interest centres on the reduction of the corpuscular volume, which in one case was as great as from 101 to 62 per cent. of the normal average. The author can find no explanation of his observed facts other than a considerable destruction of red cells. How this destruction is brought about is not evident, but it is suggested by Dr. BROUN that it is due to the mechanical injury of the red cells by the violently contracting muscles. One of the factors of training would appear to be the education of the hæmatopoietic system to replace the destroyed elements; in the untrained animal the response of new blood formation appears to be delayed, in this respect resembling the behaviour after hæmorrhage in a normal animal.

Hints of some such phenomenon of blood destruction accompanying unaccustomed exercise have been conveyed by previous observations; for instance, FEIGL[2] was able to demonstrate traces of hæmoglobin and hæmatin in the serum and urine of untrained soldiers after hard marching; but the present observations are up to now the clearest and most convincing on the subject. There has always been a tendency to look upon post-holiday lassitude as a purely psychic affair. It is worthy of note that the lassitude may have a physiological basis.

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DIVERTICULUM OF THE BLADDER.

DIVERTICULA of the urinary bladder, as distinct from the multiple sacculations seen in cases of urethral obstruction, are comparatively rarely met with. For this reason little general attention has been paid to them. This is the more unfortunate in that proper treatment is able to effect a complete cure of the symptoms which arise from them, whilst neglect is invariably followed by urinary troubles which are bound to lead eventually to the death of the patient, though the end may be delayed by years of ill-health and intermittent suffering. Mr. J. SWIFT JOLY, elsewhere in this issue, relates his experience of this condition. He has treated 14 cases by various methods, and has been able to trace the subsequent history of the majority of them. A perusal of his paper shows how many years it takes a urinary surgeon to acquire what, in comparison with many other diseases, must be considered a very moderate experience. The full description of his cases, therefore, together with the conclusions at which he has arrived, form a very valuable contribution to the subject, and will doubtless serve as a guide to other surgeons who have only had the opportunity of dealing with an occasional case. In a recent review[3] of this disease, Mr. W. GIRLING BALL relates the successful cure of two men by excision of the diverticulum, and gives a good account of views which have been held of the pathology of offsets from the bladder cavity.

The balance of evidence seems to be in favour of a congenital origin for these diverticula, very probably an abnormal budding out of the embryonic ureter. Curiously enough, they do not as a rule give rise to trouble until after the age 40, and the symptoms which call attention to them are then usually those of infection. The seriousness of the situation lies in the inability of the diverticulum to evacuate its contents. Once implanted there the infection proceeds almost unchecked in the stagnant contents. Not only has the wall of the recess but little muscular tissue in it so that collapse can only be brought about by increased general abdominal pressure, but when the bladder contracts it tends to close the communicating aperture, so shutting off the diverticular contents during micturition. This explains why, after the passage of a quantity of relatively clear urine, a patient, within a few minutes, may pass a volume of most offensive water. The diagnosis suspected from such symptoms as this is confirmed by cystoscopy or cystography. Of these the latter is the more certain, for whilst during the routine cystoscopy of a number of urinary cases diverticula will be seen from time to time, this form of examination may be very unsatisfactory in advanced cases of the disease. The true bladder cavity may be so contracted that there is no room for proper manipulation of the cystoscope; it may be almost impossible with the utmost patience to obtain a clear viewing medium, or the cystoscope may pass straight into the diverticulum so that a most perplexing picture is presented to the cystoscopist's astonished gaze. Cystography, on the other hand, will almost always reveal the presence of a diverticulum, though lateral or oblique views may be necessary.

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[1] Blood Destruction After Exercise. Studies from the Rockefeller Institute for Medical Research. Reprints, vol. xlv., i. and ii., 7 and 27.

[2] Biochem. Zeitschr., 1916, lxxvi., 88.

[3] St. Bartholomew's Hospital Reports, vol. lvi., part 2.

In the treatment of vesical diverticula nothing short of radical removal of the sac is effective. Mr. Joly warns against preliminary suprapubic cystotomy with a view to combating infection. It makes matters rather worse, owing to the occlusion of the communicating aperture by the contracted bladder referred to above. If the renal function is so much damaged that any considerable operation is contraindicated, not only must the bladder be drained, but two small tubes should be introduced into the diverticulum for irrigation purposes. Extravesical preliminary drainage of the septic sac renders subsequent removal, in the best of circumstances, a difficult operation, a still more troublesome procedure. Mr. Joly has tried all the recognised methods of excision, except that by which the diverticulum is reached by the sacral route. He favours, where possible, extra-peritoneal suprapubic excision. His advice when the serious problem of a coexisting prostatic obstruction confronts the surgeon is to remove, if possible, the prostate at the same time as the diverticulum. If the condition of the patient will not allow of this, the diverticulum should be removed first, and the prostate after a lapse of one or two weeks. The results of operation upon these cases depend upon the degree of infection already present, or, more accurately, whether a serious extension to the kidneys has taken place. When these organs are but little affected the results are excellent. The recognition of this fact raises the question of the advisability of removal of a diverticulum which may be discovered accidentally during a cystoscopy for some other urinary lesion. Such a measure may reasonably be held to be justifiable in view of the very serious consequences which ensue when infection takes place.

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OPERATIONS ON THE CARDIAC NERVES IN ANGINA PECTORIS.

Apart from the nerve ganglia which lie in the heart itself, there are two sets of nerves supplying the heart—namely, the sympathetic from the cervical ganglia and branches from the vagus. Recently attempts have been made to influence the pain in angina pectoris by operations on both these sets. Prof. Fritz Brünig,[1] of Berlin, reports the work hitherto undertaken in this direction. Experimental physiology teaches us that the accelerator fibres to the heart pass in the sympathetic, whereas the depressor fibres run in the vagus, but, as Dr. Brünig points out, these facts have been deduced from observations on animals, and recent advances in our knowledge have shown that there are often great differences between the vegetative functions in man and in animals, and therefore any such analogies must be accepted with caution. The fact that many heart conditions, especially angina pectoris, cause such great pain leads us to the conclusion that the nerves to the heart contain not only efferent but also afferent fibres, which bring the pain into consciousness. In 1899 Frank had the idea of resecting the cervical sympathetic and its ganglia to combat the pain in angina pectoris, and in 1916 Jonescu carried out the operation in one case. In 1922 he and Tuffier both reported a further successful case. In January, 1923, Dr. Brünig extirpated the left cervical sympathetic with good results, while in the beginning of this year Pleth and Coffey reported four or five similar operations, with one death. The operation consists in resecting the whole of the cervical sympathetic nerve with its ganglia, including the stellate ganglion, in this respect differing from the earlier operations for Graves's disease, epilepsy, and glaucoma, which left the last-named ganglion intact. In Dr. Brünig's case he succeeded not only in permanently relieving the pain, but also in checking the attacks of rise in blood pressure (at times over 100 mm. Hg) usually associated with the disease. This is significant, as repeated attacks of constriction of the blood-vessels (the cause of the rise in blood pressure) must in the end lead to changes in the walls of the vessels, and predispose to cerebral hæmorrhage. The results of the operation are, as shown by Jonescu's case (observed over eight years), permanent. Among the 12 cases reported there has only been one death, that of a man suffering from aortic syphilis and commencing aneurysm of the aorta. Dr. Brünig has now successfully operated on a further eight cases, some for other conditions.

That the results of the operation are satisfactory is not surprising, for we know that stimulation of the sympathetic causes contraction of unstriped muscle, as well in the intestinal canal as in the blood-vessels. We know also that stimulation of the vagus has an antagonising action, but it is extremely surprising when we hear from Eppinger and Hofer that they have achieved the same result in the same condition by division of the vagal cardiac branches. The reasoning that led them to try the operation was the conception that the pain in angina pectoris was caused by a vaso-motor contraction of the coronary arteries, which produced a dragging or irritation of the nerves surrounding the aorta, and that this stimulus was carried to the central nervous system by the cardiac branches of the vagus. Therefore, if these nerves were divided the pain would be relieved. Up to April of this year the operation has been carried out in six cases, three times unilateral and three times bilateral. All the cases were suffering from an aortalgia, as far as one can tell from the short accounts so far published, and there was no case of true vaso-motor angina pectoris among them. In five cases the attacks of pain were cured, while one died from paralysis of the vocal cords following injury to the recurrent laryngeal nerve. How is the fact to be explained that the interruption of two nerves hitherto believed to be antagonistic has the same effect in relieving the pain in angina pectoris? The suggestion that during the sympathetic operation the vagal cardiac branches are also injured is to Dr. Brünig, with his technique, inconceivable; but he thinks it is possible that the vagal branches are in reality sympathetic fibres arising in the superior cervical ganglion, passing through the dense plexus between the latter and the ganglion nodosum of the vagus, and out through the cardiac branches to the heart. Division, therefore, of the latter twigs would have the same result as extirpation of the sympathetic ganglion from which they arise.

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[1] Deutsche Medizinische Wochenschrift, July 20th, 1923.

So far it has only been proved that division of the vagal branches is useful in cases of aortalgia; no cases of true angina pectoris have been so treated, nor do we know whether the attacks of rise of blood pressure would be influenced. On the contrary, if the so-called depressor nerve has identically the same function in man as it is known to have in animals—namely, to cause, on stimulation, a fall of blood pressure—it might be very risky to divide it on both sides, thereby cutting off a valuable safety-valve for the heart. The indication, therefore, for the vagus operation is very limited as compared with the sympathetic, for, first, it is only applicable to aortalgia, and, secondly, in cases of angina pectoris it may not be entirely without risk. But if it can be proved after extensive use that it still has good results, then it may be preferable, as being more conservative, and necessitating only division of a nerve as compared with resection of the whole cervical sympathetic chain. The technique of the vagus operation could, however, be simplified. Hofer traces the vagus nerve close up to the jugular foramen and then traces its branches down to the thorax, and only those which pass freely into the thorax are divided, but great difficulty must be experienced in avoiding the superior and inferior laryngeal nerves. Dr. Brünig therefore suggests that the carotid sheath should be opened for a distance of about 5 cm. in its lower portion, and that the whole sheath should be removed for a similar distance, leaving the vessels and vagus nerve bare in this region. By this means all the nerves running in the sheath must be divided, including the depressor. But he maintains that the sympathetic operation is the better, both physiologically and because it has a larger field of application. The future will, however, show which is preferable. One thing is certain, that operations on the cardiac nerves will increase our knowledge of their physiology, and therapy will thereby benefit.

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THE FOURTH YEAR OF THE HEALTH MINISTRY.

The issue of the fourth annual report of the Ministry of Health, for the year ending on March 31st, 1923, coincides with the resignation of its head, on his translation from the charge of the nation's health to that of its finances. Whatever regret may be felt at the loss of Mr. Neville Chamberlain almost before he had time to make the wisdom and breadth of his outlook felt in public health matters, there are compensations in the destination to which he has been called. The history of the Ministry since its foundation, and of the efforts of Mr. Chamberlain's predecessors to cope with its problems, no less than the substance of this last report, show clearly that the work of the Ministry has been hampered throughout by lack of funds at its disposal. The new Chancellor of the Exchequer will at least have an intimate knowledge, for example, of the dire need of houses and of the steps being taken to promote and encourage building with the least possible cost to the nation. Some success has already been achieved in this direction. It is stated in the report that the amount which Parliament will be asked to vote as a grant in aid of the deficit on housing schemes is £8,710,000, nearly £1,000,000 less than in the preceding year. The provision of employment and relief of distress again have been attempted in two ways—indirectly through authorising loans to local authorities for expenditure on public works, and directly through grants for maternity and child welfare and for milk distribution. In this regard it is noted as gratifying that though the continued need for economy renders it impossible to contemplate extensions of this work on a large scale, local authorities are not only maintaining their existing services, but in many cases by more efficient administration are able to effect improvements. The position of tuberculosis schemes is not dissimilar; rigid examination of expenditure has enabled local authorities to provide at least the same amount of treatment as in the previous year, though the grants approved did not allow of important extensions. The situation is reminiscent of that of the little old woman of small means who housed her abundant progeny in a shoe and supplemented their inadequate diet with a liberal castigation. There must be a limit to the extent to which such stern methods can succeed, and we trust that the new Chancellor may see the need of allocating larger grants for health purposes. Meanwhile we welcome the new Minister of Health, Sir William Joynson-Hicks, who may expect to get at least a sympathetic hearing from his colleague at the Treasury.

In bidding farewell to Mr. Chamberlain we would call attention to the succinct memorandum which has just been issued by a departmental committee appointed by him on the subject of cancer. The personnel of the committee and the terms of the memorandum will be found on p. 479 of our present issue. Its object is to summarise in non-technical terms our present knowledge with regard to the ætiology and incidence of cancer, and to offer for the consideration of local health authorities some suggestions which may be useful to them in their efforts to inform public opinion on this important subject. Of the many leaflets attempting to summarise the cancer problem which have been submitted to us this one appears the most convincing and authoritative, and it will form a classical document of the state of knowledge in 1923. Apart from the appointment of this committee, we are informed that the Minister has directed the medical intelligence service of his Department to keep in touch with developments of cancer investigation, and that researches of an epidemiological and statistical character, both at home and internationally, in regard to cancer are in progress. Full and careful consideration will, moreover, be given to any means by which it would appear that the Ministry can use the resources at its disposal to aid cancer inquiries, in coöperation with the Medical Research Council or the special cancer laboratories and research institutions. This pronouncement does no more than confirm our confidence that responsible authorities at the Ministry of Health are fully alive to the anxiety felt by the public for the keen prosecution of cancer research. In this and in the many other medical and hygienic problems which will shortly engage him we trust that the period of office of the new Minister will be a fruitful one.

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JOINT ACTION AGAINST VENEREAL DISEASES.

The National Council for Combating Venereal Diseases and the Society for the Prevention of Venereal Diseases, after each considering and unanimously accepting the Trevethin report, have decided to confer in order to determine what joint action can be taken for giving effect to the recommendations contained in the report. This conference will meet after the summer vacation. We welcome the prospect of these two societies working together for the common good, for it is the obvious duty of the medical profession to give guidance and assistance to the public in matters where medical experience counts for so much. The proposal to set up a medical tribunal, whose conclusions and recommendations could be submitted to public opinion, took shape as the result of correspondence 18 months ago between the then Minister of Health and the chairman of the Medical Consultative Committee. It must be cheering to Lord Dawson to see the fruition of his tireless effort. With united leadership a number of urgent questions regarding venereal disease still outstanding may achieve solution without delay.

Annotations.

"Ne quid nimis."

BRITISH ASSOCIATION AT LIVERPOOL.

The ninety-first annual meeting of the British Association for the Advancement of Science opens at Liverpool on Wednesday, Sept. 12th, when Sir Ernest Rutherford will deliver the presidential address on the Electrical Structure of Matter. On the following day Prof. G. H. Nuttall, who presides over the section of Physiology, will give an address on Symbiosis in Animals and Plants. Papers to be discussed at this section include one by Prof. J. J. R. Macleod on Insulin and its Value in Medicine, and one by Dr. F. W. Edridge-Green on the Effect of Blood in the Retina on Colour Equation. On Friday Prof. G. Elliot Smith will address a general meeting of the Association on the Study of Man. Local arrangements include excursions to places of interest and visits to works and factories. The Liverpool housing scheme will be inspected by one party and the waterworks of the town by another. Planter's margarine works, the lactose factory at Haslingden, and the Union Cold Storage Company's plant are among the industrial concerns to receive a visit. Public interest in the administration of mental hospitals is recognised in that an excursion is arranged to the County Mental Hospital at Rainhill. It is proposed, as usual, to give a series of public lectures during the meeting of the Association, in Liverpool and in surrounding towns, while four lectures will be arranged specially for young people. A scientific soirée will be held on Sunday evening, Sept. 16th. The sections will meet in the buildings of the University of Liverpool, while the reception room is in the large and centrally-situated St. George's Hall.

DUST INHALATION AND PULMONARY DISEASE.

Considerable attention has in recent years been paid to the effect of atmospheric pollution in causing lung diseases; hence special interest attaches to an unusually complete investigation recently carried out by Dr. E. L. Middleton, one of the medical inspectors of factories. The results are reported in two documents, and the reader is, for some reason unexplained, compelled to peruse both to understand the work in its entirety; this method of presentation will, we hope, not be made a precedent. The main report[1] is one of the best dealing with occupational risk issued from the Home Office. The processes concerned are well explained and clearly illustrated, so that those unfamiliar with industrial conditions can easily understand. These conditions vary immensely; in Sheffield tenement grinding "hulls" or "wheels" still exist, hopeless places of which it has been said they were *built*, not *designed*. Their low, discoloured ceilings, with swarf from the wet grinding accumulated on floor, walls, beams, working clothes, and the men themselves; dark, even on bright sunny days; damp, always; with an entire lack of all hygienic needs for cleanliness or welfare, all call urgently for rapid elimination from modern industrial life. Fortunately different workplaces exist in such up-to-date factories as those at Falkirk, Accrington, Wolverhampton, and Birmingham. Mechanical factors concerned with danger from the sudden fracture of rapidly revolving wheels, the structure of grindstones, and methods of removing or abating the dust danger, are fully dealt with, but medical readers will rather be interested in morbidity and mortality which prevail among the men, of whom 1153 were submitted to careful medical examination.

The findings are important, even though the conditions of the inquiry forbade recourse to X ray examination or prolonged observation. They establish that diminution of chest expansion due to age is not so important as that due to dust inhalation, and that the greatest loss of expansion occurs among those most exposed to the inhalation of fine silica dust. The resulting morbidity is discussed under the headings of tuberculosis, bronchial catarrh, bronchitis and pulmonary catarrh. Definite evidence of tuberculosis was found in 7·07 per cent. of wet sandstone hand-grinders (with their special exposure to silica dust), as compared with 2·76 for all other groups of men examined. Pulmonary tuberculosis associated with dust exposure was found to claim an undue proportion of its victims late in life; thus, whereas the apex of the curve for male deaths in Sheffield (not specially exposed to dust) was at age 40, that for Sheffield grinders and cutlers was about age 50. Those so affected possessed signs more or less pronounced of fibrosis of the silicotic type. Bronchial catarrh confined to the larger bronchi, on the other hand, was slightly more prevalent among glazers and dressers with considerable exposure to irritating dust having a low content of silica; indeed, the silica-stone workers were those least affected. Chronic bronchitis was found following upon established bronchial catarrh and associated in glazers and dressers with rather a different type of fibrosis from that caused by silica dust: a type which originates round the larger air-passages, in distinction to silicotic fibrosis, which originates in the alveolar areas. Pulmonary catarrh, distinguished by cough and "tightness on the chest," is described as depending on the presence of fibrosis and as being a sequela to it. It is peculiar to silicosis, and appears to have a bad prognosis.

This investigation, while it confirms the observations of others in reference to the toxic character of silica dust, is remarkable for establishing a train of clinical symptoms associated with inhalation of other dusts than silica, such as those composed of emery and other oxides of aluminium, and of carbide of silicon. Fibrosis, bronchitis, and pulmonary catarrh represent silicosis, which predisposes to tuberculosis, on the one hand, or may progress without that complication to a fatal issue. Bronchial catarrh and bronchitis with interstitial fibrosis, with no peculiar predisposition to tuberculosis, constitute a separate type of pneumonoconiosis which follows upon inhalation of irritating, but non-toxic, dusts. Fortunately for the health of the metal trade, grindstones are giving way to manufactured wheels which generate far less dust and are not composed of silica. Although more expensive to instal, they outlast the grindstones, are economical in the end, and do the work better. This change in the wheels used will probably do more in the next few years to eradicate tuberculous silicosis from the industry than any other possible preventive measure. Hence we note with gratification that the code of regulations proposed to control the industry bears far more heavily upon the users of grindstone wheels than of manufactured wheels; and also that a suggestion, which may accelerate the change, is made for granting compensation under the Workmen's Compensation (Silicosis) Act, 1918.

A careful and intensive inquiry into the amount and types of dust to which different processes give rise rounds off the investigation. The table in which the results—obtained by using Owens's dust-counter—are set forth is given as an appendix to the report, while the discussion of the results appears in the annual report.[2] Attention was paid in particular to the presence of fine particles of silica, which, on account of the physical and chemical form in which it occurs, is the prime cause of fibroid phthisis in the industries under review. The degree of danger was found to depend on the concentration of such dust in unit volume of air, but the visual appearance of the air was no criterion of the dust present. The most injurious dust is so fine that it floats in the air and is diffused far from its point of origin to become a source of danger to neighbouring workers. Evidence is adduced in favour of intermittent exposure, even though the second process followed has its own different dust risk. The efficiency of methods of dust prevention by the application of water at the grinding point, or of dust removal by localised exhaust draught, or of dust dilution by general ventilation, was estimated by dust-counts. The whole work provides a sound basis for administrative action and has added to scientific knowledge.

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[1] Report on Grinding of Metals and Cleaning of Castings and the Effects of Dust Inhalation upon the Workers. E. L. Macklin and E. L. Middleton. H.M. Stationery Office. 1923. Pp. 100. 4s.

[2] Annual Report of Chief Inspector of Factories for 1922. [Cmd. 1920.] Chapter V. E. L. Middleton. Pp. 92–105. 1923. 5s.

BRITISH JOURNAL OF ANÆSTHESIA.

WE welcome the first appearance of the *British Journal of Anæsthesia*, a publication that it is proposed to produce quarterly,[1] the contents of which are to be concerned entirely with anæsthetics and the practice of this special branch of medicine. The Editorial Board, the names of which appear on the cover, comprises representative anæsthetists from the great towns of England and Scotland. It is, however, the ambition of the promoters of the journal to make its scope Empire wide, and they hope to bring into association with themselves representatives of the British Dominions beyond the seas. The first number augurs well for the future success of the journal. It starts appropriately with an historical article from Sir D'Arcy Power, and this is followed by a long account of some clinical experimental work on the use of drugs in combination by E. P. Donovan and J. T. Gwathmey. W. J. McCardie writes on broncho-pulmonary complications following anæsthesia, J. Blomfield gives a digest of his experience of sacral analgesia, and there is an account of new anæsthetics by C. Langton Hewer and a comprehensive abstract and bibliography of current anæsthetic literature. It will be realised that the magazine is a most useful one for any practitioner much concerned with anæsthetics, and we have no doubt that if the journal goes on as it has begun it will be a valuable addition to periodic medical literature.

FREE INSULIN.

A MESSAGE from Toronto announces the free distribution of insulin to diabetics in the province of Ontario who present a certificate from their medical man that they are unable to meet the cost of the treatment. As a matter of cold argument there is doubtless much to be said on both sides of the question whether this is a sound social procedure. Doles of all kinds are objectionable. Those who have are already taxed sufficiently for the benefit of those who have not. Diabetes is not a catching disease, so that the reasons which have led to the free distribution of diphtheria antitoxin and salvarsan do not apply. Things which are to be had for nothing are generally used wastefully. The cost will rise progressively by the very success of the treatment in prolonging the lives of diabetics. Contrariwise, it is the business of the State to preserve its lives and to recognise that it is a paying proposition so to do. The public is entitled to enjoy the benefit of discoveries which have been made wholly or in part with the aid of public funds. Monopolies are held conditionally on no one being injured by their existence. Such and such are the pros and cons which are bandied about for dialectical exercise. The medical profession will recognise that they are almost wholly beside the point. The entire hospital system is a plain monument to the ideal that the sick have a call on the service of the sound, that the needy are entitled to the help of those who have what they require, and that those who are sick as well as needy are a charge upon everyone. So long as mankind clings to its immemorial axiom that life on any terms is better than no life at all, it will be unthinkable that a potent and valuable remedy should, as a piece of actual practice, be withheld from anyone merely because he has not got enough money to pay for it. The public notoriety which has been achieved for insulin makes it particularly impossible that it should be left as a class remedy. There were inhumanity and disappointment and pain enough through the period when everyone with diabetic children and friends knew all about it and very few could get it. Now that it is available in ample amounts, there ought to be no more difficulties. Whether free insulin should be supplied by some analogue of the Surgical Aid Society or by the public authorities is a minor question of technique. There is not so much difference between the two nowadays, and the State seems to be the obvious and simple medium. But the guiding principle is clear. It is the motto of Guy's Hospital—*dare quam accipere.*

THE HISTOLOGICAL STUDY OF NEOPLASMS.

RECENT developments in the experimental study of the origin of tumour growth have in great part diverted attention from the results of the traditional lines of investigation rendered illustrious by the work of Waldeyer, Virchow, Cohnheim, and Ribbert. Dr. G. W. Nicholson's studies in tumour formation, of which No. VII.[1] has just appeared, come as a useful reminder of the prime necessity of accurate histological work as the basis of knowledge in all cellular problems. Dr. Nicholson has come to the conclusion that tumours arise in displaced or dislocated cells or cell-groups of the tissue of origin, and in Study VII. extends this conception to the heterotopic new growths in which the histological differentiation departs from that of the surrounding organ. With an extensive and exact knowledge of the literature and a skilful choice of well-executed figures the author marshals the evidence to the conclusion that the heterotopic tumours arise from normally differentiated cells by an intrinsic transformation of which there are many examples apart from tumour growth. Without abating one jot of our admiration for the author's painstaking devotion to a laborious specialty, it is permissible to venture the suggestion that the ultimate solution of the problems of neoplasia will come from a combination of the methods of descriptive and experimental pathology, rather than from their pursuit as separate disciplines.

CARDIO-VASCULAR COMPLICATIONS OF KYPHOSCOLIOSIS.

DR. Ernest P. Boas,[2] medical director of the Montefiore Hospital for Chronic Diseases, New York, who reports an illustrative case with a review of the literature, remarks that the functional disturbances of the respiration and circulation connected with kyphoscoliosis have not received the attention to which they are entitled. Although the frequency of dyspnœa in such patients was known to Hippocrates, Bouvier in 1874 was the first to show that dilatation of the right chambers of the heart was a very frequent finding in scoliosis. The most complete investigation is to be found in a monograph published in 1899 by Bachman, based on 197 personal cases of scoliosis or kyphoscoliosis which came to autopsy, as well as 79 cases recorded in the literature. Of the total 276 cases 247, or 89·5 per cent., presented an organic lesion of the heart or pericardium, but only 13 had organic valvular defects. Among 154 cases in which the heart was examined more carefully to determine the nature of the hypertrophy or dilatation 87, or 56·4 per cent., had hypertrophy and dilatation of the right ventricle, 27, or 17·5 per cent., of the left ventricle, and 40, or 25·9 per cent., of both ventricles. Bachman also noted that displacement of the heart upward and in an opposite direction to the scoliosis was very frequent, giving rise to a tortuous and angular deviation of the aorta, the large vessels, and inferior vena cava. Of 195 deaths studied by Bachman, 116, or 59·4 per cent., were due to cardiac failure and 24 to tuberculosis. The usual symptoms are dyspnœa, due at first to pulmonary atelectasis and emphysema, and later to myocardial insufficiency, cyanosis, and œdema of the legs. Attacks of palpitation and pain may occur in crises. The pulse is not infrequently rapid and may be irregular. As the myocardial insufficiency progresses, dyspnœa, cyanosis, and œdema become more marked, the liver becomes enlarged, the excretion of urine is greatly diminished, and anasarca and ascites may ensue. The prognosis in patients with kyphoscoliosis depends mainly upon the reserve power of the heart. It is unfavourable when once the signs of myocardial insufficiency are established, and the end is frequently precipitated by intercurrent pulmonary affections. Dr. Boas's patient was a woman, aged 29, in whom scoliosis was first noted at the age of 9, and had slowly and progressively become worse. For 10 years she had suffered from attacks of giddiness appearing every month, and for about five years from dyspnœa on exertion. Examination showed the case to be one of paroxysmal auricular fibrillation with symptoms of myocardial insufficiency. The issue of the case is not recorded.

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[1] Published by Messrs. Sherratt and Hughes, Manchester. Annual subscription, £2 post free; single copies, 10*s.* 6*d.*

[1] Guy's Hospital Reports, vol. iii., fourth series, No. 3, 1923, p. 298.

[2] American Journal of Medical Science, July, 1923.

LIFE ASSURANCE AND SYPHILIS.

The bearing of syphilis upon life assurance is discussed by Dr. W. P. S. Branson in the current number of *St. Bartholomew's Hospital Reports* (vol. lvi., part 2.). Dr. Branson begins by inquiring into the incidence of syphilis among the insuring population, and comes to the conclusion that the best estimate is a figure of about 10 per cent. He then discusses the effects of syphilis as a lethal disease, and points out that it may kill as the result of (1) general paralysis of the insane, (2) aortic aneurysm, (3) gummatous disease of the cerebral vessels, (4) tabes dorsalis, (5) epithelioma of the tongue, implanted on syphilitic leucoplakia, (6) suicide. Dr. Branson admits that there are other causes—one of the most common is cardiac failure from syphilitic disease of the coronary arteries, and this probably increases the mortality amongst syphilitics to a large extent. The author next takes up the period at which syphilis produces fatal results and points out that general paralysis and aortic aneurysm cause death between 30 and 50, while tabes, when it kills, as a rule kills late in life. He is not impressed with cerebral syphilis as a cause of death, but the statistics of the American Life Offices showed that the mortality among syphilitics was very high the first six years after infection, and death was almost always due to cerebral syphilis. Dr. Branson next discusses the question as to whether treatment can cure syphilis. It is well known that syphilis has been cured by mercurial treatment as recommended by Jonathan Hutchinson, who noted the occurrence of a second primary chancre after such treatment, and cases have been described of second infections after treatment with arsenic; but it is probable that in the great majority of cases once syphilis has been contracted, whatever the treatment, it is always liable to recur. This is especially true when any secondary manifestations of disease have developed. Dr. Branson does not place extravagant confidence in a negative Wassermann result. The blood test may be negative whilst the cerebro-spinal fluid is positive, and it is no uncommon event for the blood to be negative to-day and positive in six months' time. He says, however, that he considers a positive W.R. as a bar to life insurance. While agreeing with Dr. Branson that a negative W.R. is of no value as evidence of a permanent cure of syphilis, we are not so sure that a positive W.R. should be a total bar to life assurance. In a recent case a proposer, who had been perfectly well for seven years after contracting syphilis, was found to have a positive W.R., and in his anxiety to turn it into a negative one he had no less than 20 injections of neo-salvarsan in 12 months, the W.R. continuing positive, though he himself was in good health. Dr. Branson draws up rules as to the eligibility for insurance of lives who have had syphilis, and comes to the conclusion that those who have exhibited tertiary lesions, who have Argyll Robertson pupils, or leucoplakia of the tongue are ineligible, while increased rates must be charged for those who have had secondary manifestations and have been thoroughly treated for three years or more. He considers those who have been thoroughly treated in the primary stage and can produce evidence of negative W.R. three years or more after contracting the disease may be taken at ordinary rates. Some experienced observers would not entirely exclude cases of tertiary skin lesions, as many of these cases often live to a very considerable age. But all cases, even those giving a history of a primary sore only, should, we are convinced, be rated up.

EDIBLE FUNGI.

The latest publication of the Natural History Department of the British Museum is a Handbook of the Larger British Fungi,[1] by Mr. John Ramsbottom, M.A., F.L.S., assistant in the Department of Botany. Types have been selected for description on the ground of their economic and biological interest. In dealing with the fleshy agarics the basis of selection has been the edible or poisonous qualities of the species, the term "edible" being used simply to imply that the fungus has been eaten without ill effects. In this country only the field-mushroom (*Psalliota campestris*) and the horse-mushroom (*P. arvensis*) are commonly eaten, and for most people the cultivated variety of the field-mushroom is the only edible fungus. Mr. Ramsbottom expresses regret that this is so, for many of our common toadstools are far more delicate in flavour than either of these. This conservatism of taste is a modern failing. Classical literature contains frequent reference to various edible and poisonous fungi, and the only way in which to know whether a fungus is edible or poisonous is by being able to distinguish it in the same way as one does other edible plants and to ascertain its record. *There is*, says Mr. Ramsbottom, *no other way;* and his handbook will serve its purpose if it popularises the safe use of a number of cheap and appetising food products. The edible fungus contains roughly 2 to 5 per cent. of protein nitrogen (of which probably not more than one-third is digestible), 5 per cent. of sugars, 1 per cent. of fat, and ½ to 1½ per cent. of mineral matter. With this composition, fungi are a complete food, a fact established by the Fuegians, who live on *Cyttaria* during a large part of the year. In Central Europe, where the use of fungi as food is much more widespread, coloured wall charts are posted in the elementary schools, so that children learn from an early age the distinguishing marks of the poisonous and non-poisonous varieties.

VALUE IN DISINFECTION.

The Brazilian National Department of Health has reprinted an article from the Boletim Sanitario, No. 2, of 1923, with the view of impressing upon medical practitioners the futility of terminal disinfection in the prophylaxis of infectious disease. The gist of this article is that chemical disinfection of premises in which infectious cases have occurred can be of little value, seeing that the micro-organisms whose destruction is desired by that procedure are in number and virulence far less dangerous than those scattered through direct human agency or by means of recently infected articles. Moreover, many of these micro-organisms escape destruction by any means of terminal disinfection, whether by formalin spray or by disinfectant solution. Finally, the point is made that the employment of terminal disinfection on a large scale in all civilised cities has not diminished the infectious disease rate unless other prophylactic measures were simultaneously enforced. For these reasons, and on account of the great cost of chemical disinfection, the Brazilian Department of Health recommends the substitution for terminal disinfection of the simpler and less costly procedures of soap and water, scrubbing, and prolonged isolation and airing. In the case of dirty and dilapidated premises the usual measures of renovation are needed in addition. The Department holds that the suppression of chemical disinfection will have a good effect on the conduct of ignorant people who commit every sort of hygienic indiscretion in the course of infectious disease, confident in its redemption by the miraculous properties of the disinfectant apparatus. "People, not things, are the principal means for the distribution of disease germs, and simple measures of personal cleanliness have enormous prophylactic value." We have gladly summarised the contents of this estimable bulletin, the teaching of which coincides in a remarkable way with the lesson drawn this week by Dr. K. Simpson, deputy medical officer of health for the county borough of Croydon, from the figures in regard to scarlet fever which have come under his immediate notice. Dr. Simpson regards as a worthy object of effort the creation of a healthier state of the naso-pharynx in school children. We recall attention to a recent decree of the Prussian Ministry of Health pointing attention in the same direction.

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[1] Printed by order of the Trustees and sold at the British Museum (Natural History), Cromwell-road, London, S.W.7. Pp. 222. 7*s*. 6*d*.

THE SEDIMENTATION RATE IN ACUTE INFECTIONS.

THE rate of sedimentation of human blood shows considerable differences under various normal and pathological conditions. Thus the rate of sedimentation of woman's blood which varies from 3–5 hours is almost twice as rapid as in the case of man's blood. On the other hand, sedimentation of the blood of the umbilical cord is extremely slow and always takes longer than 24 hours. During pregnancy an acceleration of the sedimentation rate takes place and increases as pregnancy advances until delivery. In pathological conditions the sedimentation rate is most accelerated in inflammatory and febrile processes. The sedimentation rate is determined by estimation of the time required by the corpuscles of a specimen of citrated blood to sink from a certain marked level in a test-tube to another marked level. The sedimentation of the corpuscles is delayed by removal of fibrinogen, by narcotics, or by previously heating the plasma, while the addition of gelatin or gum arabic accelerates it. Dr. Mironesco,[1] of Bucharest, has investigated the rate of sedimentation of the red corpuscles in typhus, typhoid fever, and measles with an apparatus made according to the suggestions of Fähreus and Westergren. Pipettes were used 30 cm. long and 2·5 mm. in diameter, and a solution of 3·8 per cent. sodium citrate was employed to prevent coagulation of the blood. The examination was made 1, 2, and 24 hours after the blood had been collected at a room temperature of 20–25° C. In the three diseases mentioned Dr. Mironesco was able to confirm the fact that sedimentation was accelerated in a more or less marked degree. Fluctuations in rate were most pronounced in the course of the first hour. In typhus, for example, the rate of sedimentation was between 24 and 60 mm. during the first hour. The acceleration was less marked in cases of measles in the adult, in which during the first hour there was an oscillation between 11 and 20 mm. In typhoid fever the acceleration of sedimentation was usually more marked than in measles in the adult. It was also found that fluctuations in sedimentation bearing a direct relation to the severity and course of the disease occurred not only in the same disease but also in the same patient. Thus in a case of severe typhus which ended fatally the rate of sedimentation three days before death was 55 mm. during the first hour. In this case there were 2 g. of urea per litre of blood. In another case of typhus there was an oscillation between 30 and 20 mm. during the first hour, while the blood-urea was 0·90 and 0·80 g. In a case of typhoid fever with a pronounced ataxo-adynamic condition the quantity of blood-urea was 1·50 g. and the sedimentation 25 mm. during the first hour. With improvement in the patient's condition a diminution in the blood-urea took place, and the rate of sedimentation fell to less than half during the first hour (11 mm.). Dr. Mironesco concludes that there is nothing specific in the variations in sedimentation of the red corpuscles in various acute infectious diseases, for though the rate of sedimentation is usually more rapid in typhus than in measles or than in most cases of typhoid fever, the acceleration is related not to the particular disease but to certain disturbances, especially the amount of urea in the blood.

THE DECLINE OF VENEREAL DISEASE IN DENMARK.

IN connexion with the centenary celebrations of Pasteur's birthday, Prof. C. Rasch, of Copenhagen, was invited to contribute a paper on the subject of venereal disease and the campaign against it in Denmark. His small brochure, with the title "La lutte antivénérienne en Danemark," gives not only a very comprehensive review of what has been done in Denmark in the past, but it also shows what a remarkable effect modern methods of treatment have had on the incidence of syphilis in the years 1921 and 1922. With regard to the past, Denmark has certainly been a pioneer in many directions. So soon as 1672 the treatment of venereal disease by quacks was forbidden. In 1788 free hospital treatment for all cases of venereal disease was provided. As early as 1859 penalties were attached to the propagation of this disease, and ten years later its study was made compulsory for medical students. In 1874 compulsory treatment for all cases of venereal disease was introduced, and in 1900 Credé's method of dropping silver nitrate into the eyes of the new-born was made obligatory. In all these matters Denmark led the way, and in 1906 various other provisions were made for the comprehensive control of venereal disease. When Prof. Rasch was invited to give a survey of the results, up-to-date, of the venereal disease campaign, he, in coöperation with Dr. Svend Lomholt, addressed questionnaires to 130 heads of hospitals and similar institutions, and obtained information of great statistical value. It appears that the hospital accommodation in Denmark is greater than that of any other civilised country, and apart from sanatorium and asylum beds, Denmark, with a population of only 3,300,000, has about 14,300 beds, many of which are at the disposal of the subjects of venereal disease. But it seems to be rather ambulatory treatment with salvarsan and other specifics than hospital treatment that has brought the incidence of syphilis down with a run. In 1921 there were 1942 new cases of syphilis in the whole of Denmark, as compared with 1578 in 1922. The number of new cases of congenital syphilis in these two years was 142 and 95 respectively. In 1912 Dr. Lomholt investigated the number of recent cases of syphilis in Copenhagen, and he came to the conclusion that in this year there were about 1300 such cases. A comparison of these findings with those of 1922 led him to the conclusion that the incidence of syphilis had declined in this period by about 33 per cent. The evidence of these figures is supported by the impressions of most specialists with whom Dr. Lomholt has conferred, and it is noteworthy that the incidence of gonorrhœa has also shown a marked decline in the period 1910–1922. In the five-year period 1900–1904 there were 16 cases of blindness due to gonorrhœa, and in the ten-year period 1905–1914 there were only four such cases. Yet in other Continental countries about 20 per cent. of all cases of blindness are still due to gonorrhœa.

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[1] Bulletins et mémoires de la Société médicale des hôpitaux de Paris, July 5th, 1923, No. 23.

Modern Technique in Treatment.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

XXXIV.

THE TREATMENT OF ANÆSTHETIC SICKNESS.

BY anæsthetic sickness I do not here mean the persistent vomiting, a symptom of formidable post-anæsthetic toxæmia or delayed chloroform poisoning, which has definite associated symptoms. This is a comparatively rare condition and is treated on well-known lines. The condition which concerns us now is, on the contrary, very common after any anæsthetic. It is one of discomfort and even misery for the patient, but being without danger and of comparatively short duration its treatment has not received much attention. Yet the nausea and retching, even without actual vomiting, that afflict many patients during the first 24 hours after taking an anæsthetic cause so much discomfort and may so prejudice rapid recovery that they are well worth the serious attention of the practitioner. From the patient's point of view these first hours after return of consciousness are a serious affair and anything that diminishes their discomfort is very gratefully received. Moreover, if a second operation on some future occasion becomes necessary it is often the recollection of the discomforts immediately following the first that prejudice a patient against facing the ordeal once again. It is highly desirable, then, that recovery from anæsthesia should not be synonymous with temporary misery. The means to achieve this end are preventive and curative. Preventive measures are mainly in the hands of the anæsthetist, curative measures depend generally more upon the surgeon or the practitioner. It must be confessed at the start that these means in both cases depend on empirical knowledge. We are ignorant of the exact causation of the discomforts that we are trying to prevent or to cure. We do not know the physiology of post-anæsthetic vomiting. We know a good deal from many thousands of clinical observations about the likelihood of post-anæsthetic discomfort or its improbability with various types of patient, and we know similarly the harmful effects of a meal too soon before the anæsthetic or per contra of too prolonged a preliminary starvation. But in many cases we do not know whether there will or will not be symptoms needing treatment after anæsthesia. Our treatment, therefore, both preventive and curative at present depends entirely on our experience.

Preventive Treatment.

This consists in (1) the proper preparation of the patient, and (2) selection of the most appropriate anæsthetic and method of administration for the particular patient. The preparation of the patient can be so overdone as to bring about more harm than good. With the ordinary healthy adult the less that his usual habits are interfered with the better. The operation should be arranged for a time about corresponding with that of a meal in the ordinary course of affairs, so that the stomach will be reasonably empty. An aperient should be given 36 hours before the operation time. The old practice of giving an enema an hour or two before operation is to be discouraged. The less the patient is interfered with shortly before the anæsthetic is given the better. If he is nervous or a poor sleeper a bromide draught should be given last thing on the night preceding the operation. Bromidia is a useful preparation for this purpose. During the 24 hours before operation the patient should be encouraged to drink water or some mildly alkaline mineral water between meals. Vichy water can be freely and comfortably taken by most people who consume three pints with benefit in the 24 hours. During the same period barley-sugar should be sucked often in order to supply the desirable amount of extra glucose. Meals should be of the kind to which he is accustomed, but the proportion of carbohydrate constituents—bread, sweets, and fruit—should be increased at the expense of the protein (meat) factors. One feature in the preliminary preparation deserves more attention than it usually receives. This is the search for and removal of any form of local sepsis. Thus the mouth should be carefully cleansed after every meal, the teeth and gums examined and dealt with by a dentist if necessary. The nose and antra should be inspected and should receive any treatment found needful. The septic patient is likely to suffer from after-sickness. Besides treating the local sources of infection the practitioner will improve his patient's prospects of a comfortable recovery after anæsthesia if he supplies some general treatment too. Dr. Nixon Groves, who has given much attention to this subject, uses the hypodermic injections of isotonic iron and strychnine (Fraisse) consisting of: cacodylate of iron, 0·01 g.; glycerophosphate of soda, 0·1 g.; cacodylate of strychnine, 0·005 g. He also has seen much benefit from the preparation of aluminium hydroxide known as alocol. When an operation is not one of urgency a week or two spent beforehand in eliminating all chance of sepsis and in perfecting the blood-state of the patient is time well spent in a way that will repay both patient and practitioner after operation.

If the operation is planned for the morning, about 9 o'clock, the patient is allowed a cup of tea as late as 7 o'clock if he is awake and desires it. At 8 he has a hypodermic injection of atropine gr. $\frac{1}{100}$. Whether this is combined with morphine gr. $\frac{1}{6}$, with omnopon gr. $\frac{1}{3}$, or with scopolamine gr. $\frac{1}{100}$ must depend on the circumstances of the individual case and no routine law can be followed. In the case of nervous women it is a good thing to add the scopolamine. Patients who are likely to require large amounts of anæsthetic should have omnopon or both this and scopolamine in addition to the atropine. As regards morphia it is wise not to give it before operation unless the patient knows from experience that it suits him. Some instances of sickness after operation are undoubtedly due to morphia. Atropine, on the other hand, may be used as a routine, and is an important element in diminishing sickness after ether. The use of this drug and the abandonment of closed apparatus during long operations have greatly reduced sickness after ether administration. Another valuable measure from this point of view is to ensure mouth-breathing throughout the anæsthesia. Patients who breathe through the nose under the anæsthetic, and particularly those with partially obstructed nasal air-ways who yet strive throughout to breathe through the nose, are much more liable to sickness after than those in whom the mouth is kept adequately open throughout anæsthesia. These patients, with deficient nasal air-passages and high narrow pharyngeal vaults, are in any case the most likely to suffer from protracted taste or nausea after ether.

As regards the choice of anæsthetic one is sometimes helped by a previous history to avoid the drug which has made the particular patient sick on a previous occasion. Generally speaking, when nitrous oxide and oxygen alone are sufficient for the surgical procedure they are by far the most likely to give freedom from after-sickness. They provide, of course, no such immunity when ether or C.E. mixture have to be added in the course of operation. Short operations under ethyl chloride are rarely followed by sickness or nausea of any length of time, though they often are by headache. So far as the anæsthetist's part is concerned in preventing sickness by his actions during anæsthesia the golden rules are: (1) maintain free mouth-breathing; (2) avoid cyanosis; (3) prevent swallowing of mucus or blood in operations where this enters the mouth; (4) keep the amount of anæsthetic given within the lowest limit compatible with perfect anæsthesia; (5) do not let the patient regain consciousness before he is back in bed, and see that he is moved gently. When in bed, if the operation permits, the patient should lie partly on his right side with the head on one pillow till consciousness has fully returned. After this the Fowler position can often be adopted with advantage.

Treatment after Anæsthesia.

This consists firstly in maintaining a quiet and darkened room. The patient lies with a towel moistened with eau de cologne or with vinegar laid over his face. Before consciousness has returned a rectal injection is given of half a pint of water containing 1 dr. of potassium bromide and ½ oz. of glucose, with 20 gr. of aspirin. By this means the drowsy period is prolonged, during which the elimination of the anæsthetic is completed and the likelihood of sickness is diminished. During the next 12 hours fresh fruit juice is the most suitable sustenance. Sucking pieces of fresh pine-apple relieves thirst, combats any unpleasant taste in the mouth, and supplies glucose. It is also for many people the most welcome and least nauseating form of nourishment during the early hours of recovery. Failing this, portions of orange may be sucked. If after consciousness has returned there is definite retching or vomiting a glass of water containing 1 dr. each of sodium bicarbonate and sal volatile is to be drunk outright. This must be repeated if necessary. In addition to this after abdominal operations, if there is distension as well as nausea, hypodermic injections of pituitrin in boiled water may be employed. An alternative measure which some have found successful is repeated administration of small doses of calomel. The practice of refusing absolutely to allow anything to be put into the stomach during the first 24 hours after anæsthesia does not meet with success enough to justify the extraordinary discomfort it inflicts on the patient. In some cases sickness is brought to an end by permitting some solid food in the form of cheese-biscuits or the like. In others there is presumably a nervous element in the causation, and the application of a mustard-leaf to the epigastrium is often successful, and so is placing the patient prone on his belly. If after 24 hours vomiting still goes on the stomach should be washed out with weak solution of bicarbonate of soda, and for 12 hours nothing should be given by the mouth, the patient subsisting on glucose and saline per rectum. It must be mentioned that crème de menthe has at times been found most successful in putting an end to post-anæsthetic nausea, and that a like success is often claimed for frequent small doses of iced champagne.

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Previous articles in this series are:—

I. Medical Treatment of Gall-Bladder Disease, by Sir Humphry Rolleston. II. Early Pulmonary Tuberculosis in the Young Adult, by Dr. Claude Lillingston. III. Neuralgias of the Head and Neck, by Dr. Wilfred Harris. IV. Whooping-Cough, by Dr. T. Izod Bennett. V. Scabies and Pediculosis, by Dr. H. W. Barber. VI. Abdominal Injuries, by Prof. Charles A. Morton. VII. Aural Discharge in Children, by Mr. Harold Barwell. VIII. Vaginal Discharge, by Mr. A. W. Bourne. IX. Minor Injuries to the Eye, by Sir J. H. Parsons. X. Epilepsy, by Dr. Gordon Holmes. XI. Inguinal Hernia in Childhood, by Mr. C. W. G. Bryan. XII. Oblique Inguinal Hernia in Adults, by Prof. A. W. Sheen. XIII. Eclampsia, by Dr. Gibbon FitzGibbon. XIV. Club-foot in the Newly-born, by Sir Robert Jones. XV. Intestinal Worms, by Dr. R. Hutchison. XVI. Primary or Spasmodic Dysmenorrhœa, by Dr. G. Blacker. XVII. Measles, by Dr. Foord Caiger. XVIII. and XIX. Heart Failure, Preventive Treatment, Therapeutics, by Dr. J. Parkinson. XX. Gonococcal Epididymitis and its Bearing on Sterility, by Mr. Kenneth M. Walker. XXI. Ante-partum Hæmorrhage, by Dr. T. Watts Eden. XXII. Ringworm, by Dr. A. Whitfield. XXIII. Cystitis, by Mr. J. B. Macalpine. XXIV. Hæmorrhoids, by Mr. R. M. Rowe. XXV. Puerperal Sepsis, by Lady Barrett. XXVI. Cyclic Vomiting, by Dr. G. F. Still. XXVII. Asthma, by Dr. E. P. Poulton. XXVIII. Traumatic Rupture of the Urethra, by Mr. G. Grey Turner. XXIX. Habitual Constipation, by Dr. Arthur F. Hurst. XXX. Hypertrophied Prostate, by Prof. Charles A. Pannett. XXXI. Infantile Eczema, by Dr. H. MacCormac. XXXII. Exophthalmic Goitre and Other Forms of Hyperthyroidism. by Prof. G. R. Murray. XXXIII. Syphilis in the Woman of Child-Bearing Age, by Dr. Margaret Rorke.

Special Articles.

NOTES FROM INDIA.

(FROM OUR OWN CORRESPONDENT.)

Women's Medical Education: New Madras School.

THE new Lady Willingdon Medical School for Women, Madras, was recently opened by H.E. Lady Willingdon. The new school will have its permanent habitation in the Victory Buildings on the Marina, but the opening ceremony was performed at the Victoria Buildings, Egmore, where work will be carried on until the buildings on the Marina are ready.

Lady Willingdon was received by Surgeon-General T. H. Symons and the Hon. the Rajah of Panagal, Chief Minister, who stated that the existence of a central institution for medical training of women had been long overdue in the province. The missionaries had recently brought into existence a Medical School for Women at Vellore, but the necessity for a central Government institution continued; financial considerations had hitherto hindered the Government from bringing it into existence. The school was now to stand by the side of the Queen Mary's College and the Madras Women's Training School, associated with first-class women's and children's hospitals; before long it was sure to be raised to the status of a college.

The pupils of the institution were presented to Lady Willingdon by Dr. Mary O'Brien Beadon, superintendent of the school. Lady Willingdon then declared the new building open.

Famine Code Revision.

Some months ago a committee was appointed by the Madras Government, in accordance with a resolution of the Legislative Council, for the revision of the provisions of the Madras Famine Code, 1914. The Government have now issued orders on the Committee's report and the following points are of medical interest:—

1. The Government have accepted the Committee's recommendation that the minimum age-limit of working children be raised from 10 to 12 years, and that the grain allowance for this class be 60 tolas (1 tola = 180 gr. troy).

2. The Committee recommended a reclassification of non-working children in the light of modern physiology. Formerly there were only four classes: (*a*) in arms, (*b*) under 7 but not in arms, (*c*) under 10 but over 7, (*d*) between 10 and 14. The new classification of children recommended to and accepted by the Government, with scales of grain allowances in tolas, is as follows: (*a*) up to 1 year, 15; (*b*) over 1 year, under 5 years, 20; (*c*) between 5 and 8, 30; (*d*) between 8 and 12, 35; (*e*) between 12 and 14, 45.

3. As regards the scale of wages and allowances to adult workers the Government, after careful consideration, concluded that a general revision of the scale is not called for.

4. The Committee's recommendations relating to the treatment of pregnant women, which were supported by medical opinion and were accepted, were, briefly, that rest is essential both before and after confinement—one month before delivery, and six weeks or such longer period as the medical officer may consider necessary after delivery; and that these women should receive during these periods of rest the full wages of workers, not merely the allowance of dependents, and that the allowance of R.1 for medical comforts should be increased to Rs.2 in view of the rise in prices.

The Government have in other respects accepted a large number of the Committee's recommendations. The revision has considerably improved the Madras Famine Code.

Ankylostomiasis Campaign in Madras, 1922.

The Madras Government have recently issued the report of Dr. W. H. Kenrick, director of the ankylostomiasis campaign for the year 1922. The campaign in Madras was initiated in the early part of 1920, when, upon invitation, the International Health Board lent the services of one of their officers. Dr. Kenrick had recommended during 1921 an extension of the work in several directions, including wider publicity, control measures in tea and coffee estates for a prolonged period, practical demonstrations and control measures in schools, and field studies of the stool habits of the people with the object of devising acceptable measures to stop soil pollution. This plan of work was sanctioned early in 1922, and before the end of the year the field staff had been increased to four sub-assistant-surgeons. The intensive work begun in North Arcot district was continued throughout the year, and in addition gratifying results were obtained on several tea estates in the Anaimalai Hills. A laboratory was opened in the General Hospital, Madras, where all persons admitted were examined, and the sub-assistant-surgeon in charge was also ordered to treat and instruct as many as possible of the inhabitants of the city. One interesting piece of work was done in the Medical College, Madras, where specimens were collected from 798 students and examined for hookworm. Over 80 per cent. of the students were found infected. A campaign was also conducted in a number of schools and factories with excellent results, while an infection survey commenced in Kistna district early in November was completed in December. No definite opposition to the work was experienced, but it was often very difficult to get specimens collected, except in schools and hospitals or where large numbers of labourers are employed. The attitude of employers of estate labour was not encouraging. Attempts to secure latrine construction in villages have so far proved futile. In June, Government issued an order requesting presidents of district boards of those districts having a district health officer to report through the Director of Public Health the steps they proposed to take for the control of hookworm infection, and similar reports were requested from the presidents of other district boards and chairmen of municipal councils in September, 1922. Summaries of the replies of 17 district boards and 59 municipalities have been prepared; 15 chairmen of municipal councils reported that hookworm did not exist in their municipalities or that hookworm was not prevalent and that it was not proposed to take any steps. In reply to this, surveys were undertaken in a number of places, and at Bezwada, for example, 1239 persons were examined and 1049, or 84·6 per cent., were found infected; in Masulipatam 90·6 per cent. of those examined were found infected. It has not been possible, of course, to conduct surveys in all towns and districts where local authorities denied the existence of hookworm, but these instances prove the necessity for an educative campaign. This mistaken idea is shared by people all over the province, and it is very important that microscopic examinations and worm counts be made early in as many districts as possible, so that specific knowledge of the incidence and severity of the infection may be at hand when it becomes possible to devise means for its control.

The total number of treatments given during the year was 49,916; of these 30,672 were first, 18,781 second, and 463 third or subsequent treatments. The drugs used were thymol, beta naphthol, oil of chenopodium, and carbon tetrachloride. Only a small quantity of the latter drug was obtainable and about 1000 doses were administered. The results obtained with carbon tetrachloride were most satisfactory. A few complaints of giddiness, headache, and slight burning in the stomach were received, but beyond these no objective or subjective symptoms arose. Oil of chenopodium found most favour with the masses. One fatality occurred which was probably a result of poisoning with oil of chenopodium: A very severely infected child of 6 years of age was treated with chenopodium and in the afternoon became sleepy and listless; during the night it fell into a state of coma and died early the following day. Three patients treated with an undivided 40–50 gr. dose of thymol completely collapsed, but all revived when given injections of strychnine, and were able to walk home within three hours. Dr. Kenrick considers that an undivided dose of 50 gr. of thymol, either with or without a purge, is not safe, and even a dose of 40 gr. may produce alarming symptoms in apparently strong healthy adults.

With regard to soil pollution the report contains some very pungent remarks. One public latrine for each 22,000 inhabitants in an area populated by 45 millions of people indicates conditions in the Presidency, and soil pollution occurs to as great an extent in municipalities as it does in rural areas. Dr. Kenrick considers, however, that soil pollution is not solely a result of an insufficiency of latrines, because in many places there are latrines which are never used. The people require to be taught that such things exist and what purpose they serve. A scheme is now being devised in Madras for the extensive treatment of persons harbouring hookworms. Estimates are being prepared of the cost involved in equipping all Government and local fund hospitals and dispensaries with the necessary materials, and by the middle of this year it was hoped that free treatment for hookworm infection would be obtainable at any hospital or dispensary in the Presidency. The infection surveys previously mentioned are conducted in coöperation with local health officers and with medical officers in charge of hospitals, and during their progress every effort is made to start local campaigns of examination and treatment which will be continued by the local medical officers in charge. In connexion with the educational part of the campaign, 124 lectures were delivered to audiences aggregating 25,874. A cinema film "Unhooking the Hookworm" has also been exhibited in a number of places. About 100,000 pamphlets and circulars were distributed, largely in schools, during the year.

New College and Hospital at Vizagapatam.

The Rajah of Panagal, Chief Minister, Government of Madras, recently opened the new Medical College and King George's Hospital, Vizagapatam. In his address the Chief Minister congratulated the staff on the good fortune of securing the services of Mr. Henderson as principal of the medical college. The idea of establishing a separate headquarters and Government Hospital was that of Sir Alexander Cardew. The Chief Minister, after tracing the history of the College, said that the Andhra community need not be anxious about the inauguration of an Andhra University, now that the Medical College had come into existence, the latter being the chief and the most costly item in the starting of any university. The Andhra University would, therefore, soon be an accomplished fact. He then declared the Medical College open. The Medical School will remain in its present location for two years, by which time a pukka building will be constructed. During the opening of the King George's Hospital the Chief Minister pointed out that there were only 20,000 medical practitioners in the Madras Presidency, while there were not less than 40,000 practitioners in England and Wales. That was the justification for embarking on an expensive venture in days when retrenchment was the cry everywhere. One of the criticisms levelled against the proposal was that Ayurveda should be encouraged, but the establishment of the new hospital would in no way obstruct or hinder the progress of indigenous medicine.

Madras, August 1st.

BERLIN.

(From our own Correspondent.)

Prophylaxis of Measles.

Dr. Degkwitz, of Munich, recently reported that in 175 cases of children undoubtedly infected with measles he has been able to prevent the disease from developing by giving injections of serum taken from convalescents. The efficiency of the method was proved in hospitals, creches, and orphan asylums, and also in private practice, by the fact that children living under the same conditions, in whom no injection was made, caught the disease. Of the cases receiving serum some were injected from the second to the third day of incubation, some on the fifth and sixth day, and the remainder still later. In the first series of cases a dose of 20 c.cm. was injected, but later it was stated that 3 c.cm. were just as efficacious. A smaller dose than 3 c.cm. did not prevent infection, but greatly weakened the virulence of the disease; prodromes and complications were absent, the exanthem was rather pale, and the fever was of short duration. Injections after the seventh day of incubation had no effect on the development or severity of the disease. The lasting efficacy of the serum was shown by the fact that injection of serum of adults who had had measles when young distinctly reduced the severity of the disease. The serum must be taken from the convalescent on the seventh day after the cessation of fever, when the blood contains the greatest quantity of antibodies; 40 c.cm. are taken from a vein of the arm, giving about 17 c.cm. of serum, to which are added a few drops of a 5 per cent. solution of carbolic acid. The serum is then preserved in ampoules. Degkwitz insists on the importance of preventing young and weak children from catching the disease, and states that the latter is not so harmless as it is believed to be by the well-to-do classes, in the Children's Hospital at Munich the general mortality from measles being 15·1 per cent., rising to 28·8 per cent. in children under 2½ years of age. The Government Medical Department has already taken steps to procure the serum for professional use; it will be prepared in children's hospitals and stocked in municipal health offices, and will be issued to medical officers of orphanages, creches, and similar institutions, and also to general practitioners. The department invites the profession to assist the work by notifying cases of convalescent children in order that the serum may be taken from them, provided the parents do not object.

Medical Men and the Profiteering Act.

The Act dealing with profiteering threatens with heavy penalties and imprisonment every person who charges for necessities a price out of proportion to the cost plus a reasonable profit. This law, which hitherto applied only to the sale of foodstuffs, clothing, &c., will now be extended to the charges of medical men among others. The new provision has created great indignation among members of the medical profession. The Act has already passed its first reading; the Leipziger-Verband has asked the Government to proceed no further with it, pointing out that patients are unable to estimate a doctor's difficulty and expense connected with any given case, and will, no doubt, be very ready to inform the public prosecutor if a fee seems to be too high. The Leipziger-Verband claims that the medical profession has always shown great unselfishness in its dealings with pauper patients, and that the Workmen's Insurance Act, under which they receive inadequate pay, would not work without their assistance. They consider it degrading to be threatened with fines for misdemeanours to be classed with those of grocers, tailors, and store-keepers who have charged too much for their goods. If the new clause is not withdrawn, they demand a provision to the effect that the public prosecutor may not take action against a medical man without having previously asked the opinion of the local Medical Chamber concerning the adequacy of a doctor's fee. It is, of course, feared that without some such provision a wanton or spiteful accusation from some disappointed patient may ruin the reputation of a medical man. The Minister of Justice has replied to the effect that, as the Act has already passed its first reading, it is too late to alter its provisions, but that he will instruct the responsible officials to prosecute only in cases of unquestionable overcharging, and that in doubtful cases the opinion of a Medical Chamber will be sought.

Threatened Strike of Club Doctors.

Medical men engaged in club practice have complained that their club fees, already very small, are paid so late that they lose a great deal of their value by the progressing depreciation of the currency. Negotiations with the club boards having led to no result, the Association of Club Doctors decided to strike; August 1st was fixed as the date of commencement of the strike, and arrangements were made so that from that date no difference of fee between private and club patients would be allowed—that is to say, that payment from club members would be required at once and on the same scale as from private patients, and that certificates for sick pay would only be issued by the medical men after payment (according to the existing agreement the latter payment is included in the consultation fee). In order to help the club doctors the medical faculty gave orders that during a strike no patient belonging to a club should be attended at a university clinic, and the same regulation held in out-patient departments of the Berlin hospitals. The Government Medical Department, anxious to avoid the great harm to public health which would have resulted from the strike, offered to arbitrate; the offer was accepted by both parties to the dispute, and negotiations followed under the chairmanship of a member of the department. Finally, on July 30th, an agreement was made according to which the remuneration of medical men was to be paid weekly instead of monthly or even quarterly. The pre-war sum of 5 marks for every member of the club is to be multiplied at the time of payment by the index figure representing the increase of the cost of living. The demand that the clubs should pay additional fees for the use of instruments, electric light, &c., was not conceded, being postponed for further consideration. The strike was thus avoided at the last moment. It may be remarked that pharmacists are also preparing to strike on account of late and irregular payments by the clubs; they announce that failing more rapid payments they will henceforth require cash from club members before medicine is delivered.

Combating the Red Ant.

The biochemical section of the German Institution for Agriculture has drawn attention to the fact that large colonies of the red house-ant, *Monomorium pharaonis*, have in recent years settled in Germany. The insects not only invade pantries and provision rooms, but have also a predilection for sputum, pus, and blood, and are therefore frequently seen in hospitals. They creep into the mouth, nose, and ears of children, and in one case were even seen invading plate-cultures and cadavers in dissection rooms. Their destruction, though difficult, since they nest beneath flooring, is very important, owing to the possibility of their spreading contagious diseases. The Institution invites hospitals to notify them when the insect is observed, and will then advise as to means of destruction.

Insurance against Hospital Expenses.

The expenses for a stay in hospital have become so high for patients not belonging to a sick-club, that a disease requiring hospital treatment may sometimes entail the ruin of a household. The head of the Government Medical Department, Prof. Gottstein, has therefore suggested that for the middle classes private insurance against hospital expenses should be instituted. This has lately been done, a company called "Salus" having been established for the purpose. The insured have to pay a premium of 5 gold marks a year, for which sum the company covers the insured person to the extent of one gold mark a day, the expenses of the period in hospital not exceeding 13 weeks. The profits of the company are limited to interest at 6 per cent., and any profit in excess of this figure must be spent for purposes of public welfare.

Quality of the Milk in Berlin.

Dr. Bing has recently examined 100 specimens of milk supplied in Berlin, purchased from different shops, and has come to the conclusion that the liquid supplied was sometimes more like an emulsion of bacteria than a potable milk. The bacteria referred to were of pathogenic species; in two of ten specimens pus was present, the milk obviously coming from animals suffering from diseases of the udder. The interior of vessels serving for the transport of the milk sometimes showed a stratum of milk, casein, and fatty substances, forming an ideal nutrient medium for bacteria.

The Supply of Medical Books.

The decision of leading publishers to suspend the issue of scientific works has been expected for some time. These books have become a drug on the market, as the reading public for this kind of book no longer has any money to purchase them. Even the public and university libraries can no longer afford to do so. The Rockefeller Institution, which on former occasions had greatly supported German medical work by procuring foreign books and journals for German medical men, has made a further gift of a new series of six copies each of 400 British and American medical journals. According to a system planned by the "Notgemeinschaft" (THE LANCET, 1922, ii., 1245) two of the copies will be kept in the State libraries of Berlin and Munich, whilst the others will circulate among the libraries of German universities, at each of which they will remain for a maximum period of two months. To facilitate the circulation the universities are divided into four groups of five to six universities each, so that every university library has the respective journal at its disposition within one year of publication. The southern group of universities consists of Freiburg, Tübingen, Heidelberg, Würzburg, and Munich; the northern group includes Hamburg, Kiel, Rostock, Greifswald, and Königsberg; the eastern group Berlin, Halle, Leipzig, Jena, and Breslau; and the western group Frankfort, Giessen, Marburg, Göttingen, Münster, Cologne, and Bonn.

A Model Rontgen Institute.

Messrs. Siemens and Halske, the well-known electrical engineers, have presented to the city of Berlin a full equipment of a modern radiographical institute with all the modern apparatus, with an undertaking to replace any apparatus as soon as a new invention has made it obsolete. The medical department of the city, in accepting the generous offer, proposed the appointment of a leading radiologist, and asked the municipal council to bear the cost of installation in the Moabit Hospital, where the institute is to be established.

IRELAND.

(FROM OUR OWN CORRESPONDENT.)

The Elections.

ALTHOUGH the poll was taken on Monday the results of many contests are not yet available, as proportional representation requires time to work out. For the National University Mr. Michael Hayes, Prof. John MacNeill, and Prof. William Magennis have been returned. None is a member of the medical profession, but all took a keen interest in medical matters in the last Dail, and their return will facilitate the proposed scheme of medical legislation in the Free State.

Food Prices in Dublin.

Last November a commission was appointed by the Government to inquire into the high prices of foods which still rule in the Free State. It has now reported its inability to arrive at any practical conclusions. Not being possessed of statutory powers to compel evidence the commission found itself met by a unanimous refusal on the part of traders to give any assistance. Brewers, bakers, millers, grocers, spirit grocers, all refused to reply to questionnaires issued by the commission. On the other hand, the commission finds fault with the purchasing public in that more voluntary evidence was not brought forward. No reason is given, however, for the failure of the commission to employ investigators on its own behalf, and one cannot but think that a little more zeal on the part of the commission might have produced more tangible results. Enough evidence was obtained nevertheless to show that prices of some commodities in Dublin are inexplicable on any economic basis. Guinness's porter, produced in Dublin, costs more in Dublin than in London, Leeds, or Cork, or apparently than anywhere in the British Isles. The price of milk in Dublin, for example, is without precedent. On this point the commission makes its only definite proposal. They recommend that a commission with statutory powers of obtaining evidence should be appointed to inquire into the price of milk in Dublin and the possibility of establishing some more economic system of producing and distributing milk than at present.

Increase of Admissions at a Mental Hospital.

At the last meeting of the committee of the Grangegorman Mental Hospital it was reported that there had been an increase of 91 patients since last year. A letter was read from the Secretary of the Local Government Department suggesting that the committee should consider whether separate provision for chronic and harmless cases should not be made, and advocating the conversion of an existing building in the district as an auxiliary mental hospital.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg. Capt F. J. A. Dalton, C.M.G., to R.N. Hospl., Haslar, temp.

ROYAL NAVAL VOLUNTEER RESERVE.

Surg. Comdr. W. B. Betenson to be Surg. Capt.

Surg. Lt.-Comdr. F. J. S. Heaney to be Surg. Comdr.

Surg. Lt.-Comdr. J. B. Ronaldson to *Vivid*, addl., for R.N. Hospl., Plymouth, addl., for 14 days' training.

ROYAL ARMY MEDICAL CORPS.

Capts. to be Majs.: B. H. H. Spence (to remain secd.). W. B. Laird, R. Davidson, H. S. Blackmore, J. M. Elliott, F. R. B. Shrimshire, D. W. Bruce, W. L. Webster (Bt. Maj.), E. B. Allnutt, S. P. Sykes, H. C. Todd (Bt. Maj.), H. J. G. Wells, F. S. Tamplin, W. Stewart, and A. S. Heale.

Capt. T. P. Buist is restd. to the estabt.

The undermentioned to be Lt. (on prob.): F. J. O'Meara, W. B. F. Orr, and T. W. Davidson.

Temp. Capt. R. R. Law relinquishes his commn. and retains the rank of Capt.

ARMY RESERVE OF OFFICERS.

Maj.-Gen. O. R. A. Julian, late R.A.M.C., having attained the age limit of liability to recall, ceases to belong to the Res. of Off.

Maj. and Bt. Lt.-Col. A. J. Chambers, having attained the age limit of liability to recall, ceases to belong to the Res. of Off.

ARMY DENTAL CORPS.

Lt. (temp. Capt.) G. W. Allen to be Capt.

ROYAL AIR FORCE.

Flight Lt. W. G. L. Wambeek is granted a permanent commission, J. J. Walsh is granted a short service commission as a Flight Lt., G. M. Mellor is granted a temporary commission as a Flight Lt., and F. K. Wilson is granted a short service commission as a Flying Officer and is seconded for duty at the Bristol Royal Infirmary.

INDIAN MEDICAL SERVICE.

Col. to be Maj.-Gen.: W. H. Ogilvie.

The King has approved the retirement of the following officers: Lt.-Col. C. E. Williams, Maj. H. S. Hutchison, Maj.-Gen. Sir C. C. Manifold and Maj. N. H. Hume, and of the resignation of Capt. O. Wilson.

REGISTRATION OF HEALTH VISITORS IN SCOTLAND.—The Scottish Board of Health announce the opening of a register of health visitors. Persons discharging on behalf of a local authority all or any of the duties of a health visitor under a scheme of maternity service and child welfare or of tuberculosis or otherwise, and also persons discharging all or any of the duties of a school nurse under a scheme of school health administration, may apply for certification and registration. Forms of application will be supplied by the Board, 121a, Princes-street, Edinburgh.

CANCER:

MEMORANDUM OF DEPARTMENTAL COMMITTEE OF MINISTRY OF HEALTH.

A representative committee was recently ppointed by the Ministry of Health to draw up a emorandum on cancer for the guidance of local uthorities. The constituent members were: Sir George ewman (chairman), Dr. C. J. Bond, Sir George uchanan, Dr. S. Monckton Copeman, F.R.S., Dr. ajor Greenwood, Prof. F. Gowland Hopkins, F.R.S., rof. W. S. Lazarus-Barlow, M.D., Dr. J. A. Murray, r. T. H. C. Stevenson, Dr. S. Wyard, Lieut.-Colonel . B. Smallman, M.D. (secretary).

The terms of the memorandum are as follows:—

haracteristic Features and Natural Course of Cancer.

In this memorandum the term "cancer" is applied a group of morbid conditions known to affect man nd lower animals in all parts of the civilised world. he members of this group differ widely in naked eye nd microscopical appearances. They also differ in e age of the individuals affected, in the rapidity ith which they run their course, and in their liability become generalised throughout the body. But ey all agree in that (i) they are manifestations of isordered overgrowth of some tissue of the body, i) they are at first local, (iii) they are not encapsuled, v) they progressively invade the deeper parts,) they readily undergo degenerative changes, i) they tend to become disseminated to distant parts the body, (vii) they lead sooner or later to the death the individual in the vast majority of cases.

From the standpoint of preventive medicine and ublic health administration, there is a conspicuous ntrast between cancer and groups of other morbid nditions, such as the acute infectious diseases or berculosis, for which the fundamental principles prevention are well established. From the mass of edical experience and literature on cancer, old and w, we have an extensive knowledge of its natural urse and pathological anatomy; from mortality d other records we know much about its occurrence d geographical distribution. But knowledge useful r its prevention is still far from complete. The root use or causes on which the occurrence of cancer pends remain obscure. We do not possess any ecific means of producing immunity against cancer, we have against small-pox, nor have we any specific eans of curing the disease analogous to quinine for alaria or arsenobenzol compounds for syphilis. all these directions much valuable research work s been undertaken, both within laboratories and tside them, and such research is being further rsued. Study with this object ought to receive ery possible support from central and local health thorities, from those responsible for hospitals and her institutions, from voluntary agencies, and from e general public.

Extent of Cancer Mortality and its Increase.

In a population of 37,885,242 persons in England d Wales in 1921, a total of 46,022 deaths were tributed to cancer. These figures imply that out each average million persons 1215, and out of each ousand 1·21, died of cancer. The death-rate per 00 of the population attributed to cancer in England d Wales has gradually increased from 0·32 in 51–60 to 1·12 in 1911–20, and 1·21 in 1921. To me extent this fourfold increase is due to the fact at a larger proportion of the population than rmerly is now of those ages at which deaths from ncer commonly occur; but when full allowance s been made for this ageing of the population, the crease is from 0·33 in 1851–60[1] to 0·97 per 1000 in 1911–20, and 1·01 in 1921, so that in the space of two generations the recorded mortality has trebled.

It has long been matter for discussion to what extent this increase has been due to improved diagnosis and more accurate certification of cause of death. There can be little doubt that these factors have been contributory, but unfortunately it has now to be recognised that they will not account for the whole of the recorded increase. Superficial cancers, such as those of the tongue or the female breast, were readily recognisable as such even 60 years ago, by the time death occurred. Yet in the 20 years' period 1901–21 (after making allowance for the ageing of the population) the mortality of males ascribed to cancer of the tongue has increased from 38 per million living in 1901 to 53 in 1921, and that of females from cancer of the breast from 148 in 1901 to 190 in 1921, increases of 39 and 28 per cent., respectively, in 20 years. During the same period the mortality, similarly stated, of the total population from all forms of cancer increased from 841 per million in 1901 to 1007 in 1921, or by 20 per cent. There is only one part of the body frequently attacked by cancer, the womb, in respect of which significant increase in mortality is not recorded during these 20 years—a fact which may in some degree be attributed to the fall in the birth-rate.

During this period of 20 years, from 1901 to 1921, in which cancer increased by 20 per cent., the general death-rate fell by 32 per cent., that of infants by 45 per cent., and that from tuberculosis by 38 per cent., while substantial declines were recorded with respect to most other causes of mortality.

An increase of mortality attributed to cancer is the common experience of modern civilisation.

The frequency with which different parts of the body are attacked by fatal cancer differs greatly in different countries; it may differ over a period of years even in the same country; and changes are occurring not only in respect of the parts of the body attacked by cancer, but also in regard to the ages at which deaths occur. In this country the tendency is for deaths from cancer to occur later in life than formerly, and this change has been going on, at least amongst females, for many years. The latest available returns show that the death-rate from cancer is not increasing for males up to 45 years of age, and for females up to 60. The most rapid increase is occurring in extreme old age.

Great differences in regard to the parts of the body attacked by cancer also exist between the sexes. The excess of deaths of females (over males) from cancer is entirely due to malignant disease of the breast and generative organs; in most other parts of the body a considerable excess is recorded for males. There is a great difference between the relative frequencies of different forms of cancer amongst married and single women. Cancer of the womb is more fatal to married and widowed, and cancer of the breast and ovary to single women. In 1911–20, for every 100 deaths of single women from cancer of the breast, there were 392 deaths of married women, for every 100 deaths of single women from cancer of the ovary there were only 272 deaths of married women, but for every 100 deaths from cancer of the uterus in the single women there were as many as 1009 amongst the married women. During this period there were 463 deaths of married and widowed for every 100 deaths of single women, so the excess of deaths for the married is much larger than normal in the case of cancer of the womb, but smaller than normal in those of the breast and ovary. The death-rates for 1911–20 corrected for age distribution are not yet available, but for the years 1911–13 we have the following figures, which are death-rates per million women living corrected for age distribution:—Cancer of the womb: Unmarried women, 169; married and widowed, 293. Cancer of the breast: Unmarried women, 346; married and widowed, 238. Cancer of the ovary: Unmarried women, 60; married and widowed, 31.

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[1] Another way of presenting the facts is this. In 1851–60 e mean population living in England and Wales is estimated to ve been 18,996,916 of whom 60,196 (317 per million living r annum) were recorded as dying of cancer. In 1911–20 an estimated mean population of 35,750,765 the number of aths ascribed to cancer was 399,511 (1,117 per million living r annum).

Proclivity to Cancer.

The large majority of people go through life, even to old age, without suffering from cancer, but the geographical and social distribution of cancer mortality shows that the risk of being attacked by cancer is one which is widely disseminated. In a broad sense, liability to cancer is not an attribute of any particular social class, profession, or occupation. It is to be inferred, therefore, that the occurrence of cancer depends, to an important degree, on personal predisposing factors. For the purpose of this memorandum there would be no advantage in detailing or summarising studies or speculations on the nature of those factors, on the specific, general, or constitutional antecedents of cancer, or on the meaning of "proclivity" to cancer. Knowledge is not far enough advanced. It is right, however, to point out that *hereditary* predisposition to cancer has not at present been proved to be of any practical importance in man; that it cannot be asserted with scientific authority that the use of any particular article of food increases the liability to cancer, or prevents it from appearing; that no known drug or preparation will prevent its appearance or cure it when present; and that no danger of cancer has been proved to result from inhabiting houses or districts in which cancer happens to have been exceptionally common. There is no evidence to show that cancer is an infectious or contagious disease.

Chronic Irritation as a Determining Factor in the Appearance of Cancer.

One certain fact about cancer is that it frequently follows on chronic and prolonged irritation. Not all tissues, however, are equally liable in this respect. The palm of the hand, for example, in spite of its exposure to chronic irritation of all kinds, is probably never the seat of cancer. In the female breast cancer occurs far more commonly in the deeper parts of the gland than in the nipple, which is more exposed to injury. Some tissues show a special liability to develop cancer during chronic irritation, such as the skin of the face, the lips, insides of cheeks, tongue, lower part of bowel, neck of womb. Certain varieties of chronic irritation, too, are more liable to be followed by cancer than others. Thus, in the lip, long continued irritation by a clay pipe is particularly dangerous; in the tongue, irritation by a jagged tooth or badly fitting toothplate; in the womb, the chronic ulceration which may follow confinement. Again, syphilitic disease affecting the tongue or female external generative organs, or tuberculosis of skin (lupus) affecting the face, particularly if it has necessitated prolonged treatment, is liable to end in cancer. And lastly, workers in tar, such as briquette makers, workers with anilin or paraffin, chimney-sweeps, and mule-spinners are apt to suffer from cancer in special parts of the body as a consequence of repeated irritation by the particular agent concerned.

This liability of cancer to follow chronic irritation of so many different types is remarkable, and leads to the supposition that beneath them all there lies some common factor—as yet unrecognised—which is fundamental to the passage of a chronic inflammatory and non-cancerous condition into one that is definitely cancerous. In one variety of cancer (rodent ulcer) the distribution of the new growth is such that it suggests a close relationship with the nerve-supply of the affected part. How far this is true and how far modifications of the body itself as distinguished from the chronic irritant play a part in the ultimate production of the cancer it is impossible to say in our present state of knowledge.

Prophylaxis.

While considerations such as those in the section on Proclivity to Cancer show how far we are from being able to say how cancer is to be avoided, those under the heading of Chronic Irritation as a Determining Factor in the appearance of cancer indicate that there are at least some provocative causes of cancer which can be guarded against. Since cancer occurs more commonly in certain sites, it is prudent to notice an remove causes of chronic irritation in these sites Apart altogether from cancer, people should atten to these conditions in the exercise of common ca for their general health and fitness.

In this category, for example, and for reasons jus given, come the removal of rough stumps of teeth o replacement of badly fitting dentures; a change o habit if pipe-smoking is found to produce soreness o the same spot of the lip or tongue; an alteration o clothing which causes irritation of particular region of the body—for example, the breast; the avoidanc of constipation and other like matters. On the sam basis the possibility of establishing a chronic irritatio in a region liable to cancer gives an additional reaso for obtaining advice and treatment in disorders o the stomach, bowels, or womb. Finally, specia precautions, the nature of which is well known t those concerned, must be adopted in certain occupa tions (tar, &c.) known to entail superadded an specialised risks of cancer.

Diagnosis of Cancer.

For reasons that are indicated in the next sectio (Treatment) early diagnosis is of the greatest import ance. This means not only diagnosis of the actua existence of cancer, but, even more, diagnosis of th existence of abnormal conditions that are commo precursors of cancer. Cancer itself in its early stage is almost invariably unaccompanied by pain, and i sometimes painless throughout. This painlessness o cancer in its early stages is one of its most insidiou dangers, since it leads the patient to delay seekin medical advice. Were cancer as painful in its earl stages as toothache, there would be far fewer of thos pitiable cases in which the patient first seeks advic when the cancer has reached a stage beyond all bu palliative treatment.

Early diagnosis obviously depends upon coöperatio between the patient and the doctor. Medical advic should be sought at once, particularly if a tumour o lump is found in the breast, if an ulcerated conditio exists on the tongue, lip or skin which does not he in a few days, if there is persistent hoarseness, if mole or wart shows a tendency to grow, if blood o mucus is passed with the stools, if there is bloody o offensive discharge at other than the normal monthl periods, especially at the change of life or after it ha passed. Even with the greatest care and ski doubtful cases occur; but only after careful medica examination can it be decided whether such condition are or are not indicative of cancer, and those wh seek advice in these circumstances are taking a wis course quite apart from cancer possibilities. A abnormality is there, and whatever it is due to i should be treated and not nursed in secret.

Treatment.

If a person has not recognised that something i wrong—and such cases occur—nothing more can b said. But very many persons are aware that some thing is wrong, fear it may be cancer and put o consulting a doctor because they think that if cance be diagnosed an operation will be necessary. Quit apart from the facts that anæsthetics and antisepti have robbed operations of many of their terrors, an that many such cases would not be cancerous at al the chances of a patient must be better the earlie he or she comes under treatment. Most medica authorities believe that in cancer early operatio affords the best chance to the patient, although the would not feel justified in stating that all risk o recurrence is necessarily removed by operation, eve if undertaken in an early stage of the disease. Bu there is indubitable evidence that removal by opera tion, though ultimately followed by recurrenc enables many people to live a natural life in comfo for considerable periods, while in advanced cases suc removal may relieve or prevent prolonged sufferin There are many cases, moreover, in which cancerou growths have been removed once and for all, th patient has lived for years afterwards without recu

nce, and has ultimately died from an entirely
fferent cause.

And, lastly, evidence is accumulating that in some
rieties of cancer, and in some situations, radium or
ray treatment, or diathermy, carried out by expert
edical practitioners, offers at least as good a chance
the patient as surgery, without the attendant
sadvantages, and in other cases it may be tried
hen surgery is out of the question. *The essential
int is that the patient should not postpone or delay
eking competent medical advice, and, above all, should
t waste time or money by trying quack remedies which
best are useless, and at worst aggravate the disease.
any condition in which cancer is suspected, immediate
d decisive action is necessary.*

The actual prospect of length of life after measures
r the removal of cancer have been taken is not a
atter for dogmatising, but without question the
rlier these measures are adopted the better.

Local Health Authorities and Cancer Questions.

Propaganda.—Many local authorities, on the advice
their medical officers of health, undertake invaluable
propaganda" in relation to certain diseases by
ans of public notices, advertisements, broadcast
flets, lectures, cinemas and the like. The considera-
ns set out above show how greatly cancer differs,
regard to the applicability of these methods, from
isease such as small-pox, for which there is a sure
eventive to be proclaimed, from other diseases of
infectious class where individuals must be urged
take precautions for the safety of their fellows, or
m diseases such as the venereal group for which
ecial and gratuitous treatment is provided out of
public funds, and requires to be advertised.
ch caution is obviously needed in announcements
the public on cancer in order to avoid overstatement,
making of promises which are not warranted by
dence, or the production of needless and mischievous
prehension of cancer. If all this is realised, know-
ge of some of the main facts of cancer (negative as
ll as positive)—such as are indicated in this Circular
nay usefully be spread through the ordinary
ncies of public health departments, notably by
truction at welfare centres, by midwives and
ternity nurses,[2] and by social welfare workers. It
d hardly be added that it is important for the
dical officer of health in advising on these matters
enlist the counsel and assistance of other medical
n, whether specialists or general practitioners, in
area.

Facilities for Diagnosis and Treatment.—It is not
templated or suggested that there should be
ablished throughout the country a public cancer
vice, analogous to the services for tuberculosis or
ereal diseases, or that for treating acute infectious
eases. Even if such a service were considered
irable, it would be out of the question until other
tters, such as the improvement of undergraduate
l post-graduate medical education in cancer
gnosis and treatment, have been further developed.
t public health authorities, insurance committees,
rds of guardians, or other public bodies concerned
uld not feel discouraged from individual action
hin the competence of these bodies from assisting
securing better facilities for diagnosis or more
ctive treatment of cancer in the areas or institutions
ler their jurisdiction. It has, for example, been
gested that local authorities, in conjunction with
local representative bodies of the medical profes-
in suitable areas (acting through a special cancer
mittee or otherwise) might periodically undertake
view of such questions as the following, considering
ach instance whether steps could and should be
en to meet the requirements of the area and the
lical profession within it, and enlisting the help of
who are likely to be of assistance :—

1) Improving the local facilities for clinical con-
ations and for pathological examinations ;

(2) Improving the local facilities for cancer treatment (operative, or provision of X ray and radium apparatus), and considering the adequacy of arrangements for this purpose at hospitals, local institutions, &c., which serve the area ;

(3) Improving the facilities for transport of patients ;

(4) Arranging locally for post-graduate demonstrations, lectures, or courses on cancer for medical men practising in the area ;

(5) Arranging locally for the education of the public as indicated in the paragraph on propaganda.

Should such local medical consideration of cancer problems lead to applications for the assistance or coöperation of public health authorities as well as of voluntary agencies and individuals, the Minister is confident that these applications will be considered practically and sympathetically by those to whom they are addressed. The Department will be glad at any time to receive communications on the matters above outlined in cases in which it would appear that its action would be helpful or its knowledge of local progress in dealing with cancer questions might be increased.

Public Health Services.

REPORTS OF MEDICAL OFFICERS OF HEALTH.

THE following are some of the principal health statistics of 11 London boroughs taken from reports for the year 1922 :—

Name of borough.	Estimated (R.-G.) mid-year population.	Birth-rate.	Death-rates per 1000 of the population.				Death-rates per 1000 births.		
			All causes.	Tuberculosis.	Cancer.	Respiratory with influenza.	Infant mortality		Maternal mort. in childbirth.
							Legit.	Illegit.	
Chelsea	63,920	16·1	13·3	0·9	1·6	—	—	—	11·6
Deptford.. ..	114,100	23·1	13·8	1·4	1·3	3·4	—	—	3·0
Fulham	159,500	20·3	12·1	1·2	1·3	2·8	67	103	3·7
Hampstead ..	86,920	14·8	11·1	0·8	1·6	2·1	49	162	4·7
Kensington ..	179,100	17·6	13·6	0·9	1·5	3·5	78	135	5·0
Paddington ..	145,300	18·8	13·0	1·0	1·3	3·0	62	145	2·9
Poplar	165,700	26·6	14·3	1·3	1·1	4·2	78	115	2·7
St. Marylebone	105,200	16·0	13·8	1·2	1·6	3·5	57	170	0·6
St. Pancras ..	212,500	21·5	14·6	1·5	1·4	3·5	69	150	2·8
Southwark ..	187,220	24·4	15·5	1·6	1·0	4·4	78	121	2·8
Westminster ..	141,800	13·4	12·9	1·2	1·6	3·2	49	100	3·7

The lines indicate that the report did not give the information.

Chelsea.

Dr. Louis C. Parkes, whose impending resignation is announced, mentions in his report for 1922 that the borough council spent £965 in subsidies to the Chelsea Health Society, the Red Cross Babies' Nursing Home, the Chelsea Day Nursery, the Chelsea Branch of the Invalid Children's Aid Association, the Chelsea District Nursing Association, and to convalescent homes for nursing mothers, and his report shows the benefits accruing. Half of the amount of the subsidies is recovered as a Ministry grant. Unfortunately, the Babies' Nursing Home had to be closed in July on account of complaints of the noise of crying infants and it has not been possible to acquire other premises as yet. There were 40 deaths from influenza and 53 notifications of acute primary pneumonia during the first quarter. Sixty per cent. of the deaths from pulmonary tuberculosis occurred in institutions. There were two deaths from puerperal fever and ten from other diseases, &c., of pregnancy. Of the latter,

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The Central Midwives Board issues an instructional note on
er to all midwives on registration, and includes questions on
er in women in their examination for certificates.

four resulted from miscarriage, one illegally procured, three were due to eclampsia, and one each to rupture of the uterus, contracted pelvis, and nephritis. None of these cases had attended the ante-natal clinic of the Chelsea Health Society. The borough council have purchased a site of 60,000 square feet on the east side of Hortensia-road on which to build three- and four-roomed flats. The Ministry have required that the frontage of the site on Fulham-road be offered for sale and not included in the housing scheme.

Deptford.

In view of the decision of his council to give the annual health report a wider circulation in the borough, Dr. Charles S. Thomson has seized the opportunity to provide in it a lot of useful information for the public. The report is illustrated with photos descriptive of the maternity and child welfare work, including pictures of breast-fed babies, a healthy contented-looking mother with her recently weaned fourteenth baby of 11 months old, the Princess Louise Infant Welfare Centre, and the Municipal Maternity Home with its grounds. The report contains interesting articles on the prevention of cancer, the insulin treatment of diabetes, the science of milk production, and the prevention of rheumatic heart disease in children in the preparation of which Dr. Thomson has received the collaboration of several well-known physicians. Dr. Thomson has made another new departure by addressing a letter to his colleagues in practice on the subject of chronic rheumatism, which has evoked some interesting replies as to its ætiology, prevalence, and treatment. His report should make good reading for the citizens who frequent the public libraries of Deptford. He compliments his council on their efforts re housing, but gives some terrible examples of overcrowding. The report opens with interesting comments on the recent census. The maternity home keeps full, and the endeavour is made to limit the admissions by means of the ante-natal clinic to normal cases and to find hospital accommodation for abnormal cases elsewhere. A tuberculosis care committee is actively at work; the secretary visits all cases before and after sanatorium treatment and the families during the patient's absence from home. A fund is badly needed to help families to tide over these difficult times.

Fulham.

Dr. A. Middleton Hewat submits his first health report for Fulham. During 1922 the Public Health Committee issued to the public leaflets on the early signs and symptoms of cancer. The tuberculosis work is handicapped by the lack of institutional accommodation for infectious cases. Thirty-one cases of puerperal fever were notified with only eight deaths, the low case-fatality being probably due to the excellent arrangement with the Fulham Guardians, by which suspected cases are admitted to the infirmary without waiting for absolute certainty of diagnosis. An outbreak of six cases of typhoid fever occurred in one house in July. The original case was probably of the ambulant type and prepared the food for the subsequent cases, but the mode of infection of the original case was not discovered. The tuberculosis care committee is able to do good work in arranging for the families of patients removed to a sanatorium, thanks to the excellent organisation of social work in Fulham. Six of the 642 samples of milk were coloured with annatto. Full particulars of the working of section 28 of the Housing, Town Planning, &c., Act, 1919, are given. This section gives the sanitary authority power to do work necessary to render a dwelling-house "in all respects reasonably fit for human habitation" in the default of the owner. The statement shows the great difficulties in which the sanitary authority become involved in their subsequent effort to recover the cost from the owner. The time given in the notice must be reasonable, the exact details of the work required must be given, the owner may apparently appeal to the magistrates at any stage on any point, even if he has neglected his primary right to appeal to the Ministry of
Health, &c. The Fulham Council have brought th
unworkable nature of the section to the knowledge
the Ministry and it is not surprising to learn that i
future they will only use this section in mo
exceptional cases.

Hampstead.

Dr. Frank E. Scrase reports that Hampstea
maintains its position as a healthy urban distric
Nevertheless it does not escape a high death-rate fro
cancer, a high mortality-rate among illegitima
infants, and, for 1922 at any rate, a high maternal deat
rate from childbirth. Dr. Scrase points out the ne
for an institution for advanced cases of consumptio
and for an open-air school for delicate and suspect
children. There is a representative tuberculosis ca
committee. The need for definite action regulating t
use of preservatives is emphasised. The Hampstea
Council do not do work in default of the owner und
section 28 of the Housing, &c., Act, 1919, but ser
notices on recalcitrant owners under the Publ
Health Act. Dr. Scrase points out that the comparis
of the census of 1921 with that of 1911 shows that t
density of population in the smaller-sized tenemen
is increasing, with the inevitable result of mu
undesirable mixing of the sexes after adolescence.

Kensington.

In his comments on the census, Dr. James Fent
shows that, while in the County of London there a
116 females to 100 males, in Kensington there a
159 females to 100 males, and in South Kensingt
more than twice as many females as males. T
cases of puerperal fever were notified with six death
and a determined effort is being made to get cas
removed to St. Mary Abbot's Hospital at an earli
stage of the disease. Cases will be admitted in futu
as "suspects" and the question of notification l
in the hands of the medical superintendent. Sin
April 1st, 1923, the whole of the tuberculosis work h
been centred at the North Kensington Dispensar
as it has been found that the Brompton Hospit
which formerly acted as the dispensary for Sou
Kensington, could not conveniently do the preventi
work in connexion with contacts, suspects, &
Dental treatment is provided for expectant a
nursing mothers at each of the seven volunta
infant welfare centres. The ante-natal centre open
by Queen Charlotte's Hospital authorities in Ju
1921, was attended by 1028 mothers. The sanita
control of houses let in lodgings is one of the m
difficult problems in Kensington. About one-fifth
the 27,000 houses in the borough are let in lodging
and these houses, originally intended for one famil
may now contain up to seven or eight families a
have undergone no special adaptation for t
purpose. The borough council are anxiously waiti
for the new by-laws for this class of house which ha
been under the consideration of the London Coun
Council for the last two years.

Paddington.

Dr. Reginald Dudfield's report contains a la
amount of interesting statistical information.
comparison between the triennium of 1910–12 a
that of 1920–22 shows a large increase in the mortali
of males aged 15–25, which is in marked contr
with the reduced mortality at other age-perio
Dr. Dudfield is convinced that child welfare wo
has reduced the mortality during the first year, b
that is not enough, he says, and at present no eviden
can be adduced to show definitely that the surviv
are reared with a good prospect of a healthy aft
lifetime. The cancer mortality during 1922 show
an unusual feature—viz., an increase in the male a
a decrease in the female rate, the figures being 1·
and 1·16 respectively. The ratio of homes of l
than five rooms to all homes at the last four cens
reports has been 63·2, 64·8, 70·2, and 77. Althou
there has been this increase in the proportion of sm
homes the density per room has decreased. Th
since 1901 the number of persons per one-room
house has improved from 1·83 to 1·60, per two-roo
house from 1·69 to 1·57, per three-roomed house fr

1·27 to 1·17, per four-roomed house from 1·15 to 0·95, nd per five-roomed house from 1·40 to 1·23. Like r. Hewat, Dr. Dudfield comments on the unworkbility of Section 28 of the Housing Act of 1919 or getting repairs done, and, like Dr. Fenton, he nxiously awaits the new by-laws for tenement ouses. No less than 18 out of 67 samples of milk aken at the G.W.R. terminus were found to be dulterated (26·9 per cent.).

Poplar.

Dr. Frederick W. Alexander's report gives the usual tatistics, including those of the three sub-districts f Poplar, Bromley, and Bow. During the year bout 56,000 gallons of electrolytic disinfectant fluid ere manufactured at a cost of 1*s.* per ten gallons. his is diluted to half strength before distribution. t is used for the three public baths in the strength f 1 part of chlorine per two million parts of water, he total amount supplied to the baths being nearly 000 gallons. During 1922 18,082 applications for ree milk were received, of which 16,215 were granted t an approximate cost of £8500. The report of the hief health visitor mentions that the mortality mong "toddlers" was very heavy. Comparing ith the previous year, the mortality during the econd and third years of life was more than doubled, uring the fourth year almost doubled, and during he fifth year slightly decreased. The increase is ccounted for by deaths from respiratory diseases in he early months of the year.

St. Marylebone.

Dr. Charles Porter in a foreword to his report escribes what is done to bring home to the individual he fact that hygiene is not all communal by means f various "weeks," such as Baby week, Health week, nd Rat week, by congresses, by lectures, by leaflets nd posters, and by the helpful coöperation of the ress. There are now only 12 cows kept in the orough. The borough council have on more than ne occasion represented to the Ministry and to the ondon County Council the need for the registration f premises, in which meals are provided or food is old ready cooked, or is prepared for sale, but up to he present no action has been taken by either of hese authorities. A case which was suspected to e typhus fever occurred in November, and was emoved to the North-Western Hospital. The usual recautions as to disinfection, &c., were taken, and o further case occurred. The patient recovered, nd the nature and cause of the illness remained bscure. At the end of the year, though a great art of the site for the Council's housing scheme had een cleared, the approval of the Ministry to the cheme had not been obtained. A liquid known as Fluid D" is being tried for the spraying of verinous premises, and up to now the results have been airly satisfactory. Dr. Porter's report opens with nteresting local information obtained from the ensus returns.

St. Pancras.

Dr. T. Shadick Higgins, who has now taken up is work at Capetown, submits his tenth and arewell report. The death-rate was higher than in he three preceding years, partly owing to influenza n the first quarter, and partly owing to measles, hich caused 100 deaths of children from January to ay. The census shows the unsatisfactory state of ousing. More than half the families live in teneents of one or two rooms. The dwellings occupied y one family number 9975, and those occupied by ore than one family 14,685. For the 56,653 families n the borough there are only 24,660 structurally eparate dwellings. The borough council dental linic for mothers and children at the British Dentists' ospital was continued. A weekly treatment clinic s held at the St. Pancras dispensary for mothers nd children referred from the centres. The council ake a grant of £500 in aid of the Mayoress of St. ancras home for ailing children under school age. overnment grants are received by 21 institutions n the borough, amounting, with the grant to the borough council, to over £14,000. An outbreak of scarlet fever occurred at the Foundling Hospital. There were 140 cases of mild type and no deaths. In view of other epidemics in the past and for every reason Dr. Higgins thinks the governors should carry out their scheme for removing the children to the country as soon as possible. The housing situation is perhaps the gravest problem in St. Pancras. Closing orders cannot be made. Underground sleeping rooms, formerly closed, are now in use. Dr. Higgins regrets the delay in dealing with the "truly awful conditions" in one of the unhealthy areas in Somers Town, but the Ministry state that in the opinion of the London County Council there are other areas even more urgently requiring attention, and suggest that the borough council might proceed without financial assistance from the State.

Southwark.

Dr. George Millson reports a higher death-rate than for the three preceding years, the deaths from influenza, measles, and whooping-cough all being numerous. Free milk was supplied to mothers and children at a cost of £2300. There is in Southwark a large number of labourers and unemployable persons, and the outlook is not promising in this respect, as many of the boys are not attached to a trade. Two cases of anthrax were notified, contracted from Chinese skins. Both were treated by excision and Sclavo's serum at Guy's Hospital and recovered. Measles is notifiable, and so is epidemic diarrhœa in July, August, and September. Nurses are engaged by the council to attend to these diseases. A municipal nursery was opened in January and had an average daily attendance of 40.

Westminster.

Dr. Francis J. Allan reports that the housing problem is slowly solving itself, many residents in Westminster having been enabled to move nearer their work in the suburbs. Although the Westminster Council has not built any houses recently, its contribution to the County Council scheme for providing 29,000 new dwellings (exclusive of those erected on cleared insanitary areas) during the five years from January, 1920, and to other building schemes in the metropolis amounts to £32,000 per annum. The Peabody Trust has completed nine blocks in Great Peter-street, with accommodation for 95 families, and when the Great Peter-street scheme is completed, a black spot will have been removed from the city. Reduction in cost has made it easier to get repairs done. Each of the last three decades shows an improvement in overcrowding, as judged by the "two to a room" standard. Thus the percentage of the population living more than two to a room at the four last census years was 37·1, 28·5, 21·7, and 15·5. Dr. Allan deals at some length with the addition of chemicals and preservatives to food. Fifty-four of 63 samples of peas, beans, and spinach contained sulphate of copper. The council prosecute successfully as a rule if the amount exceeds 2 gr. per lb., but last year two prosecutions, where this amount was exceeded, were dismissed by a temporary magistrate. Fifteen years ago Dr. Allan induced the French packers to restrict the amount of copper used, and he has now approached the Italian packers, who have newly taken to this business since the war, with a similar object. Two vendors were fined for selling potted shrimps containing 31 and 93 gr. per lb. of boric acid respectively. An informal sample of Russian caviare contained 21 gr. of boric acid per lb. and 7·5 parts of formaldehyde per 100,000. The matter was reported to the Ministry. Subsequent samples taken at Dover and Folkestone contained from 125 to 400 parts of formalin per million. Two consignments were seized at these ports and circular letters sent to dealers, restaurants, &c., warning them against purchasing caviare so treated. As regards preservatives, &c., in food, the Westminster City Council have expressed the view that a committee should be appointed to go into the whole question anew.

Correspondence.

"Audi alteram partem."

OPHTHALMOLOGICAL TRAINING FOR MEDICAL STUDENTS.

To the Editor of THE LANCET.

SIR,—Mr. Percy Flemming's letter in your issue of August 4th touches on a very important point. I agree that the time spent by the average medical student on ophthalmoscopy is practically wasted, in that the actual knowledge obtained will not be of much service in his practice. Even after 20 or 30 years of special practice it is quite possible to be in doubt as to fundus appearances. But, on the other hand, this is not the whole story. The examination of the fundus is not at first easy. The diffident student, if encouraged rather to attend principally to external diseases, may readily give up his place in the dark room to others and not bother about the fundus. But, once he has mastered the technique, this same student may quite possibly receive a stimulus which will make him an enthusiastic ophthalmoscopist for the rest of his life. Is it not, therefore, worth while after all to encourage rather than to discourage practice with the ophthalmoscope, even when one allows that the actual knowledge gained in the student's course is insufficient to enable him to diagnose and treat, in his future practice, unless he becomes a post-graduate student of ophthalmology?

I am, Sir, yours faithfully,
ERNEST THOMSON, M.D.

Stirling, August 18th, 1923.

THE IMPERIAL CANCER RESEARCH CAMPAIGN AND THE CANCER PROBLEM.

To the Editor of THE LANCET.

SIR,—I have just seen Dr. J. A. Murray's letter in your issue of August 18th. I am quite aware that the British Empire Cancer Campaign is distinct from the Imperial Cancer Research Fund, and I do not think my letter would lead anybody to suppose that they were identical. I am also aware that the latter has been in existence for 20 years, and that the former has not yet become established. My statement that the Treasury grant to the Imperial Cancer Research Fund is utterly inadequate would be quite correct if the word "Fund" were left out. That, of course, was my clerical error. I do not know who was guilty of the libel referred to in the last paragraph of Dr. Murray's letter. As far as I am concerned I never made such a suggestion or wrote anything that would bear that construction.

I am, Sir, yours faithfully,
Blackpool, August 22nd, 1923. LEONARD MOLLOY.

X RAYS IN EXOPHTHALMIC GOITRE.

To the Editor of THE LANCET.

SIR,—My experience of the value of X rays in the treatment of exophthalmic goitre, as recorded in my recent paper, has not met with universal acceptance. I can merely state that I have recorded my actual observations, and that it is quite possible that further experience may lead me to alter these views. It has been stated that the X ray treatment of my cases has been very badly administered as shown by the presence of scars, burns, and even of carcinoma. This is, of course, correct, but it is only fair to my colleagues at the London Hospital to explain, what was perhaps not clear in my paper, that these bad results were seen in cases that came to me because they were dissatisfied with the X ray treatment. They had come from all parts of England, and the X rays had been administered in many different clinics. Not one had received this treatment at the London Hospital. The fact remains, however, that although such treatment should be safe it is in practice associated with very grave dangers, which are likely to increase if the method is widely adopted. In the London Hospital clinic there have, of course, been no burns, but the heads of this clinic have not been at all satisfied with the results of treatment as applied to my second and third groups.

I am, Sir, yours faithfully,
A. J. WALTON.

Devonshire-street, W., August 20th, 1923.

SCHOLARSHIP IN MEDICINE.

To the Editor of THE LANCET.

SIR,—Sir Henry Morris has in an article on Scholarship and Medicine (THE LANCET, August 11th) called attention, seemingly with approval, to a letter in the *Times* in which I pleaded for a liberal classical preliminary education for medical students. I adduced the great names of Harvey, Sydenham, and Hunter in support of a freer, wider outlook—men who dealt with life as well as disease.

Sir Henry Morris and Dr. Peachey, in a reply to me revive and advocate as a scholar the name of a general practitioner—Francis Adams. I am content with their championship. But this excerpt is not uninteresting. Wickham Legg, writing of Samuel Gee and himself, says:—

> "We had both been brought up in what may be called the school of Francis Adams. The real Hippocrates could be distinguished from the pseudo-Hippocrates—the residue was unworthy of the father of medicine. The 'Aphorisms' were the right Hippocrates . . . and the other writings decided by their approach to the 'Aphorisms.' With some satisfaction Gee told me a papyrus had been found in which a list of his writings was given, and in the list were the treatises considered the most foolish of all."

I have trespassed on your space in my contention but may I quote from Gee?

> "The learned physician is almost extinct. I am sorry for it, because the rank which the profession takes in the world depends chiefly upon its physicians."

I am, Sir, yours faithfully,
RICHARD GILLBARD.

Willesden Green, N.W., August 26th, 1923.

A NATIONAL PATHOLOGICAL MUSEUM.

To the Editor of THE LANCET.

SIR,—With the recommendation made by Dr. E. H. Shaw in his letter in THE LANCET, August 18th, p. 364 I agree fully; a permanent museum of microscopic pathological specimens could hardly fail to be o service both for practice and for medical education I have elsewhere advocated that an exhibition o microscopic specimens be held with a view to clearing away the mystery that still pervades the pathology of the commoner malignant tumours of man. Although some recondite biological points are involved, the immediate causal agents are easily recognisable in certain common human cancers and sarcomas, and in the process important misconceptions in genera biology are corrected.

Results obtained by Carrel and Burrows abou thirteen years ago showed that in culture tissue cell live and multiply almost without limit; whereas in the body their life is relatively short. Carrel remarked on the presence of the characteristic cell inclusions &c., in his cultures of human cancer tissue, but he could not decide what they were. If mouse cance and Fibiger's rat cancer are the same disease as the common human cancers and sarcomas, they must contain the same cell inclusions, &c., in the same relation to the tissue cells. At present the diagnosi of cancer is histological, not causal, as is that o tuberculosis. Very different causes may produce anatomical changes that require close examination for their differentiation. In many human cancer and sarcomas, such as rapidly growing squamou epithelioma and large-celled sarcomas, it is easy to see that the cell inclusions are phases of protists, which account for about one-third of the weight of the tumours. If any doubt remained, examination of molluscum corpuscles in water cultures would clear it away.

I recommend the organisation of an exhibition of microscopic preparations of human cancer and sarcoma, and of cancer and sarcoma of rats, mice, and of birds; of molluscum, variola, and syphilis; of genital tumours of dogs, and of related lesions of animals and plants. Further, that in the exhibition space should be reserved for the demonstration, in water cultures of molluscum, of streaming, budding, and other vital changes in the corpuscles. I should be happy to show sections and other preparations that I have described from 1892 onwards, and to place published drawings beside the microscopes. Such an exhibition should be kept open for at least three months, and better for a year. In this way only can be created a wide educated opinion based on visible objects. At the close of the exhibition the more illuminating specimens could be selected to form part of a permanent collection such as Dr. Shaw has recommended.

I am, Sir, yours faithfully,

J. JACKSON CLARKE.

London, W., August 17th, 1923.

DIFFERENTIAL DIAGNOSIS OF SMALL-POX AND CHICKEN-POX.

To the Editor of THE LANCET.

SIR,—The outbreak of small-pox in England reported in your issue of June 23rd is of great interest from many points of view, particularly that of diagnosis. To some of us who live abroad in the midst of native communities small-pox becomes part of our everyday experience, and a note on the differential diagnosis of chicken-pox and small-pox as followed by the Asansol Mines Board of Health, Bengal, with very satisfactory results may be of interest to practitioners at home.

The Asansol Mines Board of Health was established by Bengal Act II. of 1912 (the Bengal Mining Settlements Act) to prevent "the outbreak and spread of dangerous epidemic disease" in the coal mines of Bengal. The "dangerous epidemic" diseases referred to are small-pox, cholera, and plague, the former two of which had up to the time of the passing of the above-mentioned Act taken such an annual toll of life of the mining population as seriously to imperil the continued existence of the mining industry. Plague is, however, unknown in the Asansol mining settlement, which is 413 square miles in area and ncludes 202 collieries, 491 villages, and the two municipalities of Asansol (population 21,727) and Raniganj (population 14,536). The total population of the settlement according to the census of 1921 is 329,353.

Under the Act every mine-owner and manager is bound to furnish to the Mines Board of Health "immediate information of any case or suspected case of small-pox, cholera or plague." This clause, however, was found in practice to be inoperative as ar as small-pox was concerned, since the majority of the Doctor Babus employed by collieries—on whom the duty of informing managers of the occurrence of such cases ordinarily devolves—persistently refused, either through negligence or ignorance, to recognise small-pox when it occurred, diagnosing all such cases as "chicken-pox" and thus avoiding the legal obligation of notifying the cases to the Mines Board of Health. It was therefore necessary to circumvent such ignorance and neglect of duty on the part of the Doctor Babus, and orders were accordingly issued by he Board that "all sickness accompanied by an eruption of vesicles" must be notified as small-pox. This order had the effect of securing the notification of all cases both of small-pox and chicken-pox as mall-pox, and it became necessary therefore to select f possible some easily recognised and constant diagnostic point of difference between the two diseases, to enable the sanitary inspecting staff of the Board—who possess no medical training—to report on inquiry the true nature of the disease, and to take the necessary steps to prevent its spread when the case was actually one of small-pox.

On studying the question it was found that it was universally agreed that the eruption of chicken-pox always appears within 24 hours of the onset of fever or malaise. This then was accepted for the use of the inspecting staff as the diagnostic test of chicken-pox, and as experience accumulated it was found that in a considerable proportion of cases the eruption appeared even before the onset of fever. All cases where a vesicular eruption appeared later than 24 hours after the onset of fever were ordered to be regarded as small-pox and steps to be taken for the isolation of the cases and for the wholesale revaccination and vaccination of contacts. On the form provided by the Board for the notification of small-pox two additional headings were then introduced—one being the "Date of onset of fever" and the other the "Date of outbreak of eruption," with a view to discover the usual time of eruption of the two diseases, and it was found on analysis of many hundreds of cases that the eruption either came out on the same day as the onset of fever or else did not appear until *after a well-defined interval* of at least 48 hours, no vesicular eruption ever appearing during the second 24 hours. It therefore became evident that two vesicular eruptive fevers existed, one characterised by an eruption appearing within 24 hours of the onset of fever or malaise, and the other by the non-appearance of any eruption until after the lapse of at least 48 hours. The former of these diseases, moreover, was constantly seen to have the diagnostic features of chicken-pox as described in the standard text-books, and the latter those of small-pox. In all cases, moreover, whether of chicken-pox or small-pox, there was to be obtained on careful inquiry from the patient or the relatives a definite history of fever, sickness, or malaise, however slight or fleeting, upon which to calculate the time of the appearance of the eruption. The time of the appearance of the eruption has therefore been adopted in the Asansol mining settlement as the crucial diagnostic test between chicken-pox and small-pox, and I feel no diffidence in recommending it to all those in doubt about the differential diagnosis of the two diseases.

In conclusion, I would add that an epidemic vesicular eruption unaccompanied by constitutional disturbance or physical disability of any kind may be safely left for diagnosis to the dermatologist and need not occupy the serious attention of the medical officer of health.—I am, Sir, yours faithfully,

J. W. TOMB, O.B.E., M.D., D.P.H.,
Chief Sanitary Officer, Asansol Mines Board of Health.

Asansol, Bengal, India, July 19th, 1923.

SPASM OF THE LARYNX.

To the Editor of THE LANCET.

SIR,—In the condensed report of the discussion on this subject in the Section of Laryngology and Otology (THE LANCET, August 18th, p. 359), I am credited with associating laryngitis stridulosa with rickets. I need hardly say that in this I am incorrectly reported, and that my insistence was on the well-known association of laryngismus stridulus ("spasm of the larynx") with rickets, and on its distinction from laryngitis stridulosa (sub-glottic laryngitis or common croup). My reference to the production of closure of the glottis and restoration of voice in some cases of functional aphonia by faradisation of the lingual tonsil was only apposite to the question under discussion in so far as it suggested a particularly sensitive "motor point" for the glottis-closers. It supported Mr. Mark Hovell's contention as to the rôle of the lingual tonsil in the production and treatment of spasmodic laryngeal cough. I am, Sir, yours faithfully,

London, August 22nd, 1923. JAMES DUNDAS-GRANT.

A DEFENCE OF THE FORAMEN OF MAGENDIE.

To the Editor of The Lancet.

Sir,—In The Lancet of June 9th, which has just arrived in Adelaide, is an article on the Choroid Plexuses of the Brain which, as is ever the case with the writings of Sir John Bland-Sutton, has a strong appeal to lovers of Hunterian anatomy. But I notice that, in speaking of the foramen of Magendie (p. 1145), Sir John Bland-Sutton says: "This foramen has had such charm for teachers that it maintains a place in text-books, although sealed up by practical anatomists many years ago." As a teacher I freely admit the charm of this foramen, and as a practical anatomist I also regard it with affection, for of its presence in the undisturbed condition of the roof-plate of the fourth ventricle I have no doubt whatever.

I am, Sir, yours faithfully,
F. Wood Jones,
Elder Professor of Anatomy in the University of Adelaide.
Adelaide, July 17th, 1923.

HEART DISEASE IN EARLY LIFE

To the Editor of The Lancet.

Sir,—The recent discussion on this subject by the British Medical Association (The Lancet, August 18th, p. 355) is valuable as showing grave divergencies of opinion with regard to the treatment of this important affection. One recommends the persistent use of salicylate "in the hope of preventing recrudescence of infection." Another says "treating rheumatism by pharmacopœial doses of salicylate is only playing with a serious disease." A third remarks "agreement was general as to the value of salicylate," whilst Dr. J. G. Emanuel, of Birmingham, holds that salicylate had not diminished the incidence of carditis.

Surely it is time that the profession were in a position to speak with authority on this matter, so as to prevent any further abuse by this powerful poison. Opium is valuable to relieve pain, but if relief of pain obscures symptoms at the same time, then opium is not a good drug. Salicylates relieve pain and reduce temperature, but is this all to the good? The reduction of temperature is at the expense of a very great blood disturbance, and the pushing of salicylates is responsible for many serious results. The time has arrived when a Commission should be appointed to investigate the whole problem of heart disease, and evidence taken from all parts, so as to determine once and for all the chief cause of this great national curse.

I am, Sir, yours faithfully,
G. Arbour Stephens,
Consulting Cardiologist, King Edward VII. Welsh National Memorial Association.
Swansea, August 20th, 1923.

REST AND EXERCISE IN THE TREATMENT OF PULMONARY TUBERCULOSIS.

To the Editor of The Lancet.

Sir,—Following Dr. C. Lillingston's article on the Treatment of Early Pulmonary Tuberculosis in the Young Adult, published in your issue of Jan. 13th, much correspondence has arisen on the relative values of treatment by rest and by graduated exercise, on the whole to the condemnation of the latter. As far as the wage earner is concerned, the ideal of treatment is firstly to encompass the cure or arrest of the lesion, and secondly to fit the patient, both physically and mentally, to resume his original occupation. Immobilisation, as far as this can be effected in the case of the lung, is admittedly the first essential for the former end, but I submit that carefully graded exercise is almost as essential for the latter. In the case of working-class patients about three months of sanatorium treatment is usually allowed, but few patients can be graded in that time up to the standard of work they will have to perform when they are discharged, unless the patients are carefully selected cases and have been under efficient observation previously. A large number of working-class patients sent to sanatoria are not early cases.

Exercise is very difficult to graduate. The actual amount of work can be measured more or less accurately, but the effort necessary to perform it, and therefore, presumably, the degree of autoinoculation, varies with circumstances—e.g., atmospheric temperature, exposure to sun, previous aptitude for the type of work, &c. The doctor should supervise all the work of his patients, and, if he is able, should work with them. Patients appreciate this, and only in this way can he estimate the effort required to perform the work. Instructors can never replace the doctor, and are liable to be regarded by the patients as foremen whose business it is to get a piece of work done.

One doctor, if he acts in this way, can only supervise the work of a strictly limited number of patients, at the most 60. Most patients whom it has been possible to train and treat by graduated labour whilst in sanatoria are improved when they leave. Many subsequently relapse, because they return to the same conditions which were responsible for their breakdown, and they are probably unable to carry out the routine which they have been taught. In addition, many have to resume work which is far too strenuous, in order to gain some sort of livelihood, and even then are unable to procure sufficient food.

I am, Sir, yours faithfully,
Oxford, August 20th, 1923. W. E. Waller.

PENSIONS IN THE INDIAN MEDICAL SERVICE.

To the Editor of The Lancet.

Sir,—The fact that the more recent advertisements for recruitment to the Indian Medical Service differ vitally from those of the previous years does not appear to have attracted notice. The difference consists in the addition of a paragraph immediately after the "rates of pensions," which runs as follows: "The above rates are subject to revision after the 1st July, 1924, upwards or downwards, to an extent not exceeding 20 per cent."

As there is no probability of any revision *upwards*, it is perhaps a fair inference that pensioners must be prepared for a loss of 20 per cent. of their income after June next. Fortunately for an officer who entered the Service before July 1st, 1920, his pension will not in any case be reduced below that which he would have received under the old scale. This is a definite promise; vide India Office Memo., dated June 3rd, 1920. But what of those who entered after that date; whose pensions are not due, at the earliest, for another 14 years; and who have no promise beyond the text of the advertisement which attracted them and the regulations with which they were provided? How far down will the revision proceed, and what will be the value of a £400 pension in 14 years time? Of course, we all know, or should know, No. 1 of these regulations, which is as follows: "(1) The regulations are those in force at the present time. They are subject to *any* alterations that may be determined on." The italics are mine.

I am, Sir, yours faithfully,
August 19th, 1923. I.M.S. (retd.).

Alexandra Day at Brighton and Hove.—The Alexandra Rose Day collection on August 11th realised close on £1030, and after deducting the expenses (about £200) the remainder has been allocated as follows: Royal Sussex County Hospital, £300; Brighton, Hove, and Preston Dispensary, £85; Royal Alexandra Hospital for Sick Children and the Brighton and Hove Hospital for Women, each £77 10*s.*; Lady Chichester Hospital, the New Sussex Hospital, and the Throat and Ear Hospital, each £52 10*s.*; Sussex Eye Hospital and the Queen's Nurses, each £35; Surgical Aid Society, £17 10*s.*; Clayton and Keymer Nursing Association, £10; and the Brighton Dental Hospital, £5.

Medical News.

SOCIETY OF APOTHECARIES OF LONDON.—At examinations held recently the following candidates passed in the subjects indicated :—

Surgery.—E. N. C. Annis, Guy's Hosp. ; E. E. E. Attale, St. Thomas's Hosp. ; A. Cawadias, Paris ; H. S. Chadwick, Manchester ; H. T. Chiswell, Guy's Hosp. ; C. J. Fox, St. Mary's Hosp. ; K. P. Hare, Univ. Coll. Hosp. ; G. A. Lord, Manchester ; H. MacLachlan, Guy's Hosp. ; M. A. E. Somers, Bristol ; and J. N. Wheatley, London Hosp.

Medicine.—E. E. E. Attale, St. Thomas's Hosp. ; A. Cawadias, Paris ; J. H. Cooper, Glasgow ; J. B. Couche, Toronto ; J. Crawford, Royal Free Hosp. ; C. J. Fox, St. Mary's Hosp. ; K. P. Hare, Univ. Coll. Hosp. ; and M. S. Mahmud (Sect. II.) and W. R. H. Pooler, St. Mary's Hosp.

Forensic Medicine.—E. E. E. Attale, St. Thomas's Hosp. ; A. Campbell, Edinburgh ; A. Cawadias, Paris ; and K. P. Hare, Univ. Coll. Hosp.

Midwifery.—E. E. E. Attale, St. Thomas's Hosp. ; E. N. C. Annis, Guy's Hosp. ; A. Cawadias, Paris ; H. S. Chadwick, Manchester ; R. S. Chambers, Guy's Hosp. ; K. P. Hare, Univ. Coll. Hosp. ; G. A. Lord, Manchester ; Y. Nandan Lal, Dundee ; H. J. Powell, St. Mary's Hosp. ; and J. N. Wheatley, London Hosp.

The Diploma of the Society was granted to the following candidates entitling them to practise medicine, surgery, and midwifery : E. E. E. Attale, A. Cawadias, H. S. Chadwick, and K. P. Hare.

CONJOINT BOARD R.C.S. ENG., R.C.P. LOND.: ADMISSION TO FINAL EXAMINATION.—These regulations have now been revised as follows, being slightly different from those given in the Students' Number of THE LANCET last week. Students of recognised universities in England, Scotland, and Ireland, who have passed examinations for a degree in Medicine at their universities in the subjects of the First and Section I. of the Second Examination of the Examining Board, may enter for the Final Examination at the expiration of 30 months from the date of passing in anatomy and physiology on production of the required certificates provided they do not complete the examination before the expiration of five years of study. Members of certain recognised India, Colonial, and Foreign universities who have passed examinations for the Degree of Doctor or Bachelor of Medicine or Surgery in the subject of the First and Section I. of the Second Examination of the Examining Board may present themselves for the Final Examination under special conditions.

ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH: PARKIN PRIZE.—In terms of the bequest made to the College by the late Dr. John Parkin, Fellow of the College, a prize is offered for the best essay on certain subjects connected with medicine. The subject of the essay for the present period is, in terms of the deed, "On the curative effects of carbonic acid gas or other forms of carbon in cholera, for different forms of fever and other diseases." The prize is of the value of £100 and is open to competitors of all nations. Essays intended for competition, which must be written in the English language, to be received by the secretary not later than Dec. 31st, 1923. Each essay must bear a motto, and be accompanied by a sealed envelope bearing the same motto outside and the author's name inside. The successful candidate must publish his essay at his own expense, and present a printed copy of it to the College within the space of three months after the adjudication of the prize.

UNIVERSITY COLLEGE HOSPITAL.—A festival dinner will be held on Nov. 20th in connexion with the Rockefeller Foundation Gift to the Medical School, when Prince Henry will preside. It will be remembered that the condition of the bestowal of the Rockefeller gift imposes heavy additional charges upon the hospital connected with the Medical School. The festival dinner is intended to inaugurate a campaign to raise £500,000.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION.—Special courses in general medicine and surgery, cardiology, dermatology, diseases of children, ophthalmology, proctology, &c., have been arranged up to June, 1924. The programme for September will include a two weeks' course in general medicine and surgery at the Hampstead General Hospital in conjunction with the Hospital for Epilepsy and Paralysis, Maida Vale, the North-Western Fever Hospital, and Paddington Green Children's Hospital, from Sept. 10th to 22nd. There will also be a special course on infants' diseases at the Infants Hospital from Sept. 3rd to 21st, a course in ophthalmology at the Central London Ophthalmic Hospital, from Sept. 3rd to 29th, and a course in dermatology at St. John's Hospital for Diseases of the Skin, from Sept. 17th to Oct. 13th. For particulars apply to the Secretary, Fellowship of Medicine, 1, Wimpole-street, W. 1.

ST. MARY'S HOSPITAL.—The annual dinner of the past and present students of St. Mary's Hospital Medical School will take place at the Connaught Rooms, Great Queen-street, London, W.C., on Monday, Oct. 1st, at 7 for 7.30. Mr. V. Warren Low will be in the chair. The hon. secretary is Dr. Hope Gosse.

MUSEUM OF THE ROYAL COLLEGE OF SURGEONS OF ENGLAND.—A work by Mr. M. W. Hilton-Simpson, entitled "Arab Medicine and Surgery," was published about a year ago, and reviewed in our issue of Oct. 7th, 1922 (p. 766). Mr. Hilton-Simpson has presented the instruments figured and described in his book to the Museum, where they are now on view. They were used by the Shawiya, a Berber tribe, living near Biskra.

ST. JOHN'S HOSPITAL FOR DISEASES OF THE SKIN.—The following appointments have been made :—Consultant Physicians : Sir Malcolm Morris and Dr. James H. Stowers. Hon. Physicians : Dr. Wilfrid Fox and Dr. Henry MacCormac. Director of the Pathological Department : Dr. J. M. H. Macleod. Sir Malcolm Morris and Dr. Stowers have accepted seats on the Board of Management.

LONDON MEDICAL EXHIBITION.—This exhibition, the thirteenth of the series, will be held at the Central Hall, Westminster, S.W., from Oct. 1st to 5th. It will be remembered that admittance is confined to the medical profession, members of which resident within 50 miles of London receive cards. Other medical men desiring to take this opportunity of inspecting the exhibits in the medical, hygiene, dietetic, surgical, optical or dental sections can obtain cards on application to the Secretary at 194, Bishopsgate, London, E.C., or at the Central Hall during the exhibition week.

CANCER RESEARCH IN MANCHESTER.—In view of the recent gifts to the Christie Hospital for this purpose, announced in THE LANCET of August 18th (p. 367), it is interesting to record what has been done in Manchester in relation to the study of this disease. Mrs. Alfred Pilkington placed a sum of money in the hands of trustees to constitute the Pilkington Fund for this purpose, and in 1906 the systematic study of cancer was begun. The original sum has been supplemented from time to time. Dr. Charles Powell White was appointed to carry out research, and the University granted suitable accommodation for this purpose in the pathological department. In the deeds of foundation of the Christie Hospital, the investigation of cancer was one of the objects stipulated by the founders. From 1911 the stipend of the pathologist has been provided jointly from the Pilkington Fund and the Christie Hospital. In 1912 a legacy from Miss Helen Swindells enabled the University to equip a separate laboratory for cancer research, and to provide the expenses for its upkeep.

LAURA SPELMAN ROCKEFELLER MEMORIAL.—In our issue of August 18th (p. 345) we gave an account of the work of the Rockefeller Foundation. Another avenue of Mr. John D. Rockefeller's generosity, perhaps little known in this country, is the Laura Spelman Rockefeller Memorial, founded in October, 1910, in memory of his wife. The memorial is incorporated for general charitable and philanthrophic purposes, and is not limited geographically in its field of operations. The principal of the fund, as well as its income, may be used by the trustees in forwarding its humanitarian activities. The assets at the end of 1922 amounted to $78,074,773. During the period beginning with the Memorial's incorporation up to December, 1922, $9,361,871 had been paid on account of appropriations made by the trustees, and a sum of $3,486,888 awaits the fulfilment of conditions for payment. From 1919 to 1922 organised relief in Europe and China received a considerable proportion of the income ; non-secretarian social welfare organisations—the Y.M.C.A. and Y.M.W.A. in the United States, colleges in the Near East for education, &c.—received large sums. The various social welfare organisations during four years received over $3,299,345, while for education during the same period $801,222 were allocated. For scientific research and investigation—including the study of negro life and history, Bureau of Vocational Information, and Curie Radium Fund—$50,500, and for public health, which included contributions to many American institutions dealing with child hygiene, control of cancer, tuberculosis nursing, and maternity, $693,050 were spent during the last four years. The percentage of expenditure for public health will probably decrease in the future, not because the trustees are less convinced of the value of measures of public health in advancing human welfare, but because they feel that since the interest in and support for health enterprises are spreading widely, they may wisely turn their attention gradually to the development of less cultivated fields.

Donations and Bequests.—Mr. Robert Matthews, of Heaton Mersey, near Manchester, formerly a director of Sir Joseph Whitworth and Co., bequeathed £100 each to Carlisle City Infirmary, Newcastle-on-Tyne, Royal Victoria Infirmary, St. Mary's Hospital for Women and Children, the Pendlebury Hospital for Children, Manchester, Manchester Royal Infirmary, Dr. Barnardo's Homes, and Lord Mayor Treloar's Homes for Crippled Children.—Mr. R. Greenough, of Leigh, Lancashire, left £500 to the Leigh Infirmary.—The Manchester Children's Hospital during the past month has received donations and subscriptions amounted to £487.—The Ancoats Hospital Committee, Manchester, received £1009 as the proceeds of Daisy Days and the parade which took place in June. The Daisy Days show an increase of £281 over the figures for 1922. The Hospital Sunday Fund in aid of the Manchester and Salford Medical Charities realised £14,000; the principal grants apportioned are as follows: Manchester Royal Infirmary, £3569; Salford Royal Hospital, £1510; Ancoats Hospital, £1468; Children's Hospital, Pendlebury, £1362; St. Mary's Hospitals for Women and Children, £1327; Royal Eye Hospital, £1007; District Nursing Institution, £730; Hospital for Incurables, £706; Hospital for Consumption, £511; Memorial Jewish Hospital, £462; Northern Hospital, £315; and the smaller hospitals lesser sums in proportion.

Royal Medical Benevolent Fund.—At a meeting of the committee, held at 11, Chandos-street, Cavendish-square, W., 36 cases were considered and £285 18*s*. voted to 22 applicants. The following were new cases relieved:—

Daughter, aged 41, of M.R.C.S. who practised at Clifton and died in 1913. She started as a children's nurse in December, 1922; in June, 1923, it was found that her lungs were affected. She is now in a sanatorium and asks the Fund to help with maintenance. Her father died leaving a bankrupt estate. Voted £18 18*s*. for sanatorium treatment.

Widow, aged 64, of M.D., F.R.C.S. who practised in Staffordshire and died in 1891. Applicant has a little house property which brings in about 38*s*. per week and her rent amounts to 14*s*. per week. She has been suffering from diabetes for years and is now in hospital under treatment at £1 1*s*. per week. She asks the Fund to help her as she has to pay a debt of £194 incurred for sanitary work apart from doctor's and chemist's bills. Voted £10.

Widow, aged 74, of L.S.A., L.R.C.P. who practised in London and died after a short illness in February last. House and furniture had to be sold, and after mortgage had been paid and all expenses applicant estimates that her income will not exceed £35 per annum. At present her board and lodging costs 35*s*. per week. Voted £18 in 12 instalments.

Widow, aged 53, of M.B. who practised in Poplar and South Africa and died in 1912. Applicant, owing to physical inability, is unable to do private nursing continually. She has maintained and educated her daughter and is now hoping that her daughter will be able to secure a post. Applicant has received £86 from nursing, and pays 15*s*. per week for rent. Voted £10 in two instalments.

Subscriptions may be sent to the hon. treasurer, Sir Charters Symonds, at 11, Chandos-street, Cavendish-square, London, W. 1.

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POSITION PAGES.—Terms on application.

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE, SPECIAL COURSE IN INFANTS' DISEASES, at the Infants Hospital, Vincent-square, Westminster, S.W.

Monday, Sept. 3rd.—2–3.30 p.m., Dr. William Robinson: Summer Diarrhœa. 4.30–6 p.m., Dr. Eric Pritchard: General Principles in the Feeding of Infants.

Tuesday.—2–3.30 p.m., Dr. Eric Pritchard: Tuberculosis in Infants. 4.30–6 p.m., Dr. Helen Mackay: Demonstration, Lumbar Puncture, and Examination of Cerebro-spinal Fluids.

Wednesday.—2.30–3.30 p.m., Dr. Helen Mackay: After-effects of Diseases of the Central Nervous System. 4.30–6 p.m., Dr. Bertram Shires: Demonstration in X Ray Department; Diagnosis in Infancy.

Thursday.—2–3.30 p.m., Dr. Donald Paterson: Cases of Indigestion and Examination of Stools. 4.30–6 p.m., Dr. William Robinson: Respiratory Disease in Infants.

Friday.—2–3.30 p.m., Dr. Eric Pritchard: Round Table Consultation. Cases in Out-patient Department. 4.30–6 p.m., Dr. Donald Paterson: Lecture and Demonstration: Cœliac Disease.

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith-road, W.

Monday, Sept. 3rd.—10 a.m., Mr. Maingot: Surgical Pathology. 12 noon, Mr. Simmonds: Applied Anatomy. 2 p.m., Mr. Addison: Surgical Wards.

Tuesday.—10.30 a.m., Dr. Paterson: Medical Wards. 12 noon, Dr. Burrell: Chest Cases. 2 p.m., Mr. Sinclair: Surgical Out-patients.

Wednesday.—12 noon, Mr. Sinclair: Abdominal Surgery (Lecture). 2 p.m., Mr. Gibb: Eye Dept. 3 p.m., Dr. Pernet: Skin Dept.

Thursday.—12 noon, Mr. Simmonds: Demonstration of Fractures. 2 p.m., Mr. MacDonald: Genito-Urinary Dept. 3 p.m., Dr. Scott Pinchin: Medical Out-patients.

Friday.—10 a.m., Mr. Dudley Buxton: Dental Dept. 2 p.m., Dr. Burrell: Medical Out-patients. 2 p.m., Mr. Banks-Davis: Throat, Nose, and Ear Dept.

Saturday.—10 a.m., Dr. Paterson: Medical Diseases of Children. .

Daily, 10 a.m. to 6 p.m. Saturdays, 10 a.m. to 1 p.m., In-patients, Out-patients, Operations, Special Departs.

Appointments.

Armstrong-Jones, Sir Robert, M.D., has been appointed Consulting Physician to the Department of Psychological Medicine, St. Bartholomew's Hospital.

Cowan, A., M.B., Ch.B. Edin., Junior Surgeon, Royal Infirmary, Doncaster.

Hutchinson, J. A., M.D., M.S. Durh., to be Certifying Surgeon under the Factory and Workshop Acts for Northallerton.

Linell, E. A., M.D. Manch., Assistant Professor of Anatomy in Charge of Department of Neurology, University of Toronto.

McDonald, J. R., F.R.C.S. Edin., House Surgeon at the Durham County Hospital.

Morton, R., M.B., Ch.B. Edin., Resident Medical Officer at the Royal Mineral Water Hospital, Bath.

Vacancies.

For further information refer to the advertisement columns.

Aberdeen Royal Infirmary.—Radiographer.

All Saints Hospital for Genito-Urinary Diseases, Vauxhall Bridge-road, and 91, Finchley-road.—Res. H.S. £200.

Birmingham, Queen's Hospital.—Third P. for Out-patients. £50.

Bolton, County Borough of.—Asst. M.O.H., &c. £600.

Bradford, Municipal General Hospital, St. Luke's.—H.P. and H.S. Each £200.

Carnegie Dunfermline Trust, Abbot-street, Dunfermline.—Asst. M.O. £550.

Cheshire Joint Sanatorium, near Market Drayton.—Dental Surgeon.

City of London Maternity Hospital, City-road, E.C.—Res. M.O. £100.

Dreadnought Hospital, Greenwich.—H.S. and H.P. Each £150.

East African Medical Service.—M.O. £600.

Exeter, Royal Devon and Exeter Hospital.—Asst. H.S. £150.

Glasgow District Mental Hospital, Gartloch.—Jun. Asst. M.O. £350.

Halifax Royal Infirmary.—Third H.S. £150.

Leeds Education Committee.—Asst. School M.O. £500.

London County Mental Hospital Service.—Seventh Asst. M.O. £432.

Manchester Children's Hospital, Pendlebury, near Manchester.—Res. M.O. £120. Also Res. S.O. £80.

Manchester Children's Hospital, Gartside-street.—M.O. and Asst. M.O. £200 and £150 respectively.
Manchester City.—M.O. £632 7s. 8d.
Metropolitan Borough of Woolwich.—Asst. M.O. £400.
Redhill, Surrey, Royal Earlswood Institution.—Jun. Asst. M.O. £250.
Richmond Royal Hospital, Surrey.—Hon. S. to Out-patients.
Royal Naval Medical Service.—Surgeon-Lieutenants.
Royal Northern Hospital, Holloway, N.—H.S. £100. M.O. £150.
St. Mark's Hospital for Cancer and Fistula, City-road, E.C.—H.S. £200.
St. Peter's Hospital for Stone, &c., Henrietta-street, Covent Garden, W.C.—H.S. £75.
Samaritan Free Hospital for Women, Marylebone-road, N.W.—H.S. £100.
Sligo County Board of Health.—County Surgeon. £500. P. £250. H.S. £150.
Sunderland Royal Infirmary.—H.P. £160.
West African Medical Service.—M.O. £660.
West Bromwich and District Hospital.—Res. Asst. H.S. £180.
West London Hospital, Hammersmith-road, W.—H.P.; also two H.S.'s. £100.

The Chief Inspector of Factories, Home Office, London, S.W., announces the following vacant appointments: Cerrig-y-Druidion, Denbigh; Polesworth, Warwick; Staveley, Derby; Bridgwater, Somerset; Harrold, Bedford.

The Secretary of State for the Home Department gives notice of vacancies under the Workmen's Compensation Act, 1906, for County Court Circuit No. 1, and for County Court Circuit No. 57. Applications for the former post should reach the Private Secretary, Home Office, not later than Sept. 8th, and for the latter not later than Sept 19th.

Births, Marriages, and Deaths.

BIRTHS.

CROOK.—On August 17th, at Chiswick-place, Eastbourne, the wife of Dr. A. H. Crook, of a daughter.

MCCALL.—On August 21st, at West Lodge, Leominster, the wife of H. Dundas McCall, M.R.C.S., L.R.C.P., of a daughter.

MURPHY.—On August 12th, at Middlewich, the wife of James Murphy, F.R.C.S. Edin., of a daughter.

WARD.—On August 21st, at Oaklands, Hythe, Southampton, the wife of Dr. G. Humphry Ward, of a son.

MARRIAGES.

DOUGLAS—NEWNHAM DAVIS.—On August 23rd, at St. Mary's Church, Silchester, Arthur McDonald Douglas, M.B., Ch.B. Glasg., to Kathleen, only child of Mr. and the late Mrs. H. Newnham Davis, The Grange, Silchester, Hants.

INKSTER—COX.—At St. Alban's, Holborn, on August 27th, John Inkster, M.D., M.R.C.P., of Middlesbrough, to Olive Mary, daughter of B. H. Cox, Esq., of Toronto.

WHITTLE—FRICKER.—On August 20th, at the Parish Church, Harpenden, Claud Howard Whittle, M.R.C.S., L.R.C.P., M.B. Camb., to Phyllis Lena Fricker, eldest daughter of Guy Carey Fricker, O.B.E., of Harpenden.

DEATHS.

BOSWELL.—On August 22nd, suddenly, John Irvine Boswell, M.D. Lond., J.P., of Crawley Grange, Newport Pagnell, aged 65.

BROOKHOUSE.—On August 20th, at Ashby House, Tweedy-road, Bromley, Kent, Charles Turing Brookhouse, M.D., J.P., aged 76.

GILBERT.—On August 10th, at Highworth, Reigate-road, Reigate, Sydney Gilbert, L.R.C.P. & S., L.A.H., L.M.

LEE.—On August 15th, at Box, Wilts, Edwin Lee, M.R.C.S., M.D., J.P. (late of Dewsbury).

RANDLE.—On August 10th, at St. Ruan Minor, Cornwall, Dr. James Mayne Randle, aged 74.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

LANGHO EPILEPTIC COLONY.—The Manchester Union has issued its report on this institution for the year ended in March last. The accommodation provided is for 240 men and an equal number of women, with a hospital of 32 beds. During the year the average number of patients was 456. Since 1908–9, when the average number of fits per patient per annum was 114, a steady improvement has been obtained, the number being 29 in the year of the report. The treatment consists of regular diet, appropriate medical treatment when necessary, and open-air employment. The colonists who are physically fit have regular hours of work—the men work in the gardens and on the farm, or in such occupations as joinery, painting, shoemaking, or tailoring; the women in the kitchen, laundry, or at sewing. Ample recreation is provided; there is a weekly dance and kinematograph entertainment. The staff employed numbers 104 officers, including 55 attendants.

Notes, Comments, and Abstracts.

PUBLIC HEALTH IN BENGAL.

THE population of the province of Bengal at the census of 1921 (excluding the Chittagong Hill tracts) was found to be 46,522,293, an increase of 2·6 per cent. on that of the previous census. (The population of Great Britain was 42,857,144 in 1921.) In Burdwan Division there was a decrease of 4·9, and in Chittagong an increase of 11·9 per cent. The birth- and death-rates were 28·0 and 30·1 per 1000, as compared with 30·0 and 32·7 in the previous year, and 30·8 and 31·3 for the quinquennium (1916–20). This birth-rate of 28·0 was the lowest on record, except 27·5 in 1919, and was lower than in any other province in India except Assam and the N.-W. Frontier Province. On the other hand, only four other provinces, Madras, Burma, Bombay, and Assam, returned lower death-rates. From special investigations carried out during the past five years among a population of 15,000 persons in three selected circles of Murshidabad district, it was found that annual birth-rates varied between 24·1 and 62·90 (average 48·0); and annual death-rates between 30·2 and 88·4 (average 46·9). Dr. Charles Bentley, Director of Public Health for the province, who forwards this report,[1] considers that the normal birth-rate is probably about 46·7 (with a range from 37 to 51), and the normal death-rate about 40·0 (varying from 35 to 50 (or even more). He estimates that the actual birth and death ratios for the year were 38·3 and 40·8, "the probable ratio of omissions in the records being about 27 per cent." Verification of vital occurrences is a matter of considerable importance; in Khulna district it was found that there were 52 per cent. of omissions in the births, and 46 per cent. in the deaths, registered; in the towns it is said to be even worse, the Registration Act being "now largely a dead letter." It is useless therefore to attempt any comparison, or explanation in detail, of the variations that are indicated by the statistics, except those for the city of Calcutta.

Economic Conditions and the Birth-rate.

For the fourth year in succession the deaths have exceeded the births in this province, the excess being most marked in the three districts of Darjiling, Jessore, and Nadia, where the decrease in population has been in a ratio of 13·5, 11·7, and 10·5 per 1000 respectively; in Calcutta district (which, by reason of the disparity of the sexes, has always shown an excess of deaths over births) the birth ratio was 19·1, and that for death 33·5 per 1000. With regard to the general question of the relation between birth-rates and the economic (favourable or unfavourable) condition of the population, Dr. Bentley states that "this correlation, contrary to what is generally believed, is a negative and not a positive one. . . . This is a discovery of the very greatest importance. . . . Increased prices of food grains, while bearing heavily on certain classes of the community, tend in the presence of reasonably good harvests to benefit greatly a large proportion of the population." It would appear, however, that for all classes except the actual cultivators and distributors of the food materials concerned, increase of food prices (unless accompanied by a corresponding increase of income) will diminish their ability to obtain the necessary amount of food. "In view of the facts stated it is clear that in Bengal measures aimed at restricting the prices of agricultural production may be fraught with the very gravest consequences to the health of the population, whose prosperity is almost wholly dependent upon two factors—the general character of the harvest, and the monetary return obtained by the sale of the crops." This may be admitted for the agricultural inhabitants, who form the bulk of the population of the province; but for the three million town-dwellers (who would necessarily be affected), and as a general proposition (the very opposite to the principle of free trade), there is much to be said on the other side.

Deaths due to Cholera, Small-pox, and Other Diseases.

There was considerable increase in the cholera mortality, compared with the previous year (80,547 deaths against 54,199); but in spite of this the death ratio was 4 per cent. below the decennial mean; the ratios per 1000 are not stated, but the actual deaths recorded in the quinquennium, 1911–15, numbered 462,018 (giving an annual average of 92,403), and in the years 1916–20, 377,364 (annual average, 75,473). The disease is usually at its minimum from July to September in Bengal. "Preventive measures should be initiated early in September," and "always pressed with special vigour also in February." The districts most affected were Mymensingh (3·8 deaths per 1000), Bogra (3·5), 24-Parganas

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[1] Annual Report of Director of Public Health, Bengal. Calcutta: Secretariat Book Depôt. 1923.

(3·3), and Pabna (3·2); Darjiling escaped altogether. Preventive work is being undertaken (disinfection of water-supplies, use of cholera vaccine, &c.). In Dinajpur district, "wherever the disinfection of wells was undertaken, cholera quickly subsided." Excluding Calcutta, 4607 deaths from cholera were reported in the towns of Bengal, compared with 3863 in 1920; this is said to be "an increase of 42·3 per cent." On the figures given the increase would be 19·1 per cent., but it is stated that "the cholera death-rate is an obvious under-estimate and ought probably to be increased by at least 50 per cent."

There was a great decrease in small-pox mortality, 8157 deaths compared with 36,190 and 37,010 in 1920 and 1919, the corresponding death-rates being 0·18, 0·79, and 0·81 per 1000. "The great decrease is due to the usual periodical decline in the prevalence of the disease following the severe epidemic of 1919–20; the disease tends to recur in epidemic intervals of from five to six years," and 80 per cent. of the mortality usually occurs in the first six months of the year. In only four districts was there an increase over the decennial average (Jalpaiguri, Murshidabad, Malda, and Jessore); the highest death ratio occurred in Murshidabad (0·62 per 1000); in Calcutta it was only 0·10, compared with 1·02, the decennial average. "For the first time on record the returns make some attempt to differentiate between the various febrile affections as causes of death, which have previously all been classed under the general heading 'Fevers.'" Of the total 1,070,368 "fever" deaths, 737,223 are shown as due to malaria; but it is said that probably the deaths due to this cause are only one-half of this figure. In Chittagong division less than one-fifth of the "fever" deaths are now ascribed to malaria. It is stated that probably in the whole province from 20,000 to 60,000 deaths were caused by enteric fever (0·4 to 1·3 per 1000), the deaths so registered only numbering 5693. Only 1537 deaths were ascribed to measles, but probably the number should have been from 10,000 to 25,000. From kala-azar only 1552 deaths are reported, but if the Calcutta death-rate (0·2 per 1000) be "accepted as a fair indication of the incidence of the disease in 1921, the kala-azar deaths throughout the province cannot have fallen far short of 10,000, as against 1552 actually reported." "Plague has almost ceased to figure as a cause of death in Bengal." There were only 66 fatal cases in 1920 and 59 in 1921, of which latter 37 occurred in Calcutta and 16 in Hooghly and Howrah districts. The disease "has now reached so nearly to the vanishing point, that it should not be a difficult matter to eliminate it entirely." The great increase in deaths from "respiratory diseases," which began in 1918, due to the influenza epidemic, continues: there were 11,675 deaths so returned in 1917, 20,901 in 1918, 22,609 in 1920, and 32,367 in 1921. The heading now includes influenza, pneumonia, phthisis, and "other respiratory diseases," and many deaths formerly returned under "fever" are now placed in their proper category. Under influenza 4751 deaths were returned (0·1 per 1000), while in Calcutta the ratio was 1·0 per 1000. Dr. Bentley considers this latter ratio to be a fair representation of the prevalence throughout the province, which on this basis would mean over 46,000 deaths. In Darjiling district, which was most affected, the death-rate from this cause in the rural circles was 2·5, and in the towns of Darjiling and Kurseong, 21·4 and 7·1 per 1000. Pneumonia has now been given a separate heading in the returns, it is one of the most serious causes of death; but "only a fraction of the pneumonia mortality is correctly reported," many deaths being included under "fevers"; 11,567 deaths were returned, of which 3183 occurred in Calcutta. For phthisis the provincial death-rate was 0·1, for towns 0·9, and for Calcutta 2·3 per 1000; but with the exception of Calcutta all the figures are under-estimates. "We must therefore be prepared to see an apparent increase of tuberculosis in the future." The same must be expected in regard to dysentery and diarrhœa, which from the Murshidabad observations give an aggregate of 5·1, while the deaths actually recorded under these headings (22,258) give a ratio of only 0·5 per 1000. There were fewer deaths from suicide in 1921 (3217 against 3509 in 1920); 1819 were among females and 1398 in males, the sex proportions of the population being 22½ and 24 million respectively. Suicide among females was 30 per cent. in excess over males. In Jessore district the excess was 100 per cent. The population is 1,722,219, of whom 828,627 are females.

Deaths from hydrophobia have increased very considerably: for the years 1918–21 they have numbered 119, 179, 289, and 379 respectively. This "is most disquieting." In the Presidency division there were 170 deaths against 96 in the year preceding. "The need of facilities for preventive treatment is apparent. . . . As urged in previous reports, the question of providing for treatment in Calcutta merits careful attention." We entirely disagree with this opinion: there can be no doubt whatever that *immediate action* is required. Whether Calcutta is the most suitable place for a Pasteur institute, or no, is a matter for consideration, and other localities are available; but there can be no doubt as to the necessity for action. The successful results obtainable by early treatment should be well known in every province in India (if anywhere), and the failure to supply such necessary medical aid is to the ordinary mind inexplicable. The increase of hydrophobia deaths, from 71 in 1917 to 379 in 1921, would (it might have been supposed) have attracted the attention of some responsible authority before now, as it demonstrates the urgency of the need, and accentuates the inexplicable backwardness of the province, as compared with other administrative areas in the country. As far back as 1919, the Sanitary Commissioner with Government of India, referring to the increase in deaths from rabies in Bengal and Bihar, expressed the opinion that "a Pasteur institute more conveniently for these two provinces than is Shillong, seems indicated."

Neglect of Municipal Powers.

It is much to be regretted that, "with few exceptions, the administration of the Registration of Births and Deaths Act was grossly neglected by the municipalities charged with this responsibility. Similar carelessness was displayed in the administration of the Vaccination Act." The municipal authorities in most cases fail to realise that by the use of the powers granted to them they can greatly improve the health conditions of the areas under their control without increasing their expenditure in any way. The expenditure on sanitary works by Government, public authorities, and private individuals amounted to Rs.1,409,883, as against Rs.2,142,539 in the previous year. As an example may be noted the results of the "Flood and Flush Scheme" at Jangipur, in the Murshidabad district: the total death-rate has fallen from 52·7 per 1000 in 1918 to 31·1 in 1921; the infant mortality from 192 to 161, and that from malaria from 13·7 to 5·5. There has been a corresponding reduction both in the spleen index and in the prevalence of anopheles mosquitoes. Anti-malarial coöperative societies are making steady progress under the guidance of Rai Dr. Gopal Chandra Chatterjee Bahadur; there are now 25 branches in existence. "This movement is one of the most promising signs of the interest that has been awakened in disease prevention in recent years, and merits every possible support." Anti-stegomyia work in the ports of Calcutta and Chittagong was carried out by Dr. Batra, and very marked reduction in mosquitoes was effected. "Towards the close of the year orders were received to shut down the work at the end of the financial year." Mr. G. B. Williams, M.I.C.E., chief engineer in the Public Health Department, gives instances of the urgent need for new schemes of water-supply and drainage, and trusts that "if the financial position of the province is restored, one of the first uses made of any balance of funds available to take up as early as possible the programme of urgent sanitary works which is so imperatively necessary for the health of the community." In this hope he will be joined by all sanitarians both in India and at home.

Sanitary Measures: Lunatic Asylums.

In the Report on the working of the Municipalities in Bengal[2] during 1920–21, Mr. S. W. Goode, Officiating Secretary to Government, states that "it is a good sign that for the past few years almost all municipalities have been taking measures to improve sanitation by filling up or clearing insanitary tanks and ditches and by removing jungle; and in several instances effective steps were taken to prevent the spread of cholera and small-pox. The administration of Burdwan Municipality showed much vigour and zeal in obtaining suitable water-supplies, &c., and "the foundations of further progress have been laid." In Dacca Division the municipalities have shared in the difficulties universally caused by high prices, but have carried on their services without loss of efficiency. In Darjiling also the Commissioners are said to be progressive, and anxious to improve the amenities of their town, which is fortunate in the public spirit and mutual coöperation of its municipal representatives, as well as (we may add) the unrivalled beauty and grandeur of its situation. In other cases there appears to be failure of the executive local authority to make full use of the powers they possess. The Commissioner of the Presidency Division observes that "though the main difficulty is want of money, the result for the money spent is, in default of proper supervision, not always the best. Without the growth of a strong public opinion supporting sanitary measures, and vigorous control, there can be no marked improvement under present conditions."

Major T. C. Boyd, I.M.S., officiating Chemical Examiner to Bengal Government, in his report[3] for 1921, states that 1251 medico-legal cases were investigated, as against 1506 in the previous year; the decrease was chiefly due to fewer cases of animal poisoning, 214 less than in 1920, probably the result of the Poison Act. There was also a slight ecrease in human poisoning cases, 694 compared with 708 1920 ; opium was the poison most commonly detected.

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[2] Calcutta: Bengal Secretariat Book Depôt. 1922.

[3] Ibid.

In the Lunatic Asylums[3] in Bengal, which altogether now ave a total capacity of 1121, the total population in 1921 umbered 1210 (including observation cases), as compared ith 1261 in 1920, the daily average present being 957, mpared with 966. Of these 106 were discharged cured 1·07 per cent. of average strength). The cures were iefly cases of mania (55), melancholia (21), and insanity used by *Cannabis indica* (24). There was no epidemic lness, but the average number of sick increased from 116 130, and the hospital admissions from 612 to 861 ; fever used 222 admissions, mostly at Berhampore ; and there ere 162 cases of influenza (mostly of a mild type) at Dacca 0) and Berhampore (82). The mortality was 68·9 per 00 average strength, compared with 105·5 in 1920. Of e 66 deaths, 10 were from dysentery, eight from acute ania, and eight from pneumonia. There was not a single eath from accident or injury in any asylum. At Dacca ·73 per cent., and at Berhampore 61·37 per cent. of the ean population were employed daily in industrial work, hich resulted in a total profit of Rs. 14,124. Major-General . H. Deare, C.I.E., I.M.S., who presents this short report, to be congratulated on the satisfactory results obtained this especially difficult sphere of medical administration India.

Hospitals and Dispensaries in Bengal.[4]

There was some decrease in the number of hospital atients treated in Calcutta during 1921 (445,088 as compared ith 482,110 in 1920) owing chiefly to closure of the Mayo ospital for repairs. The largest attendance of patients as for eye diseases (38,810 against 41,307 in 1920) ; next these affections came malaria (37,176 as compared with ,584) ; influenza also showed a decrease from 10,494 to 00. There were only 80 small-pox patients, compared ith 1346 in 1920. Cholera was somewhat more prevalent 446 cases and 365 deaths, against 1335 cases and 295 eaths) ; also kala-azar (2367 cases, as compared with 1821). enereal diseases, on the other hand, showed a decrease 0,624, compared with 23,120). The surgical operations erformed numbered 44,056, a reduction on those in 1920 5,223), chiefly due to the closure of the Ripon Street ispensary. At the district hospitals and dispensaries in e province medical relief was afforded to 7,564,957 patients, compared with 7,311,782 in 1920. Nearly one-third of ese were suffering from malaria (2,350,367, as compared ith 2,270,000 in 1920). Cholera also showed an increase om 9293 cases in 1920 to 12,664 in 1921 ; kala-azar from 61 to 9198 ; and leprosy from 2290 to 3831 cases. The heme for a leper colony has been approved, and a site quired in Midnapore district. At the various hospitals d dispensaries in the province 131,629 surgical operations ere performed, a slight falling off from the record of the evious year (132,058). Major-General Deare, in concluding s report, states that medical relief is hampered in almost l district hospitals and dispensaries for want of funds ; rmission has been given in certain cases to levy a small e, the very poor being excepted.

VOYAGE D'ÉTUDES MÉDICALES.

The first part of the official report of the sixteenth oyage d'Études Médicales,[5] which took place from ugust 27th to Sept. 16th, 1922, is devoted to a description the journey and of the places visited. It is written by r. Maurice Gerst, the Secretary-General of the V.E.M., d is an admirable account, as the writer of the present te, who was fortunate enough to take part in this journey n testify. The second part contains a clear and succinct mmary of the lectures given at the various stations sited by Prof. Paul Carnot, the scientific director of the yage, and by Prof. F. Rathery, the Assistant Director. hese contain details about the situation of each resort, e means of access, the special features of the climate and e waters, together with the indications and contradications. Among the places visited were Bordeaux, rcachon, Dax, Salies-de-Béarn, Pau, Eaux-Chaudes, aux-Bonnes, Cauterets, Bagnères de Bigorre, Luchon, and ulouse. The book will serve as a pleasant memento to ose who took part in the sixteenth voyage, as well as a eful handbook of information in regard to the places sited. It is admirably printed and illustrated by numerous otographs and a map. It may be well to state that these voyages " are a yearly function, and that different parts of ance are visited. Places are reserved for a certain mber of foreign medical men, and British practitioners siring to familiarise themselves with French spas have us a good opportunity to do so.

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[4] Ibid.

[5] Le 16e Voyage d'Études Médicales aux Stations Hydro-inérales et Climatiques du Sud-ouest de la France. En dépôt la Librairie Arnette, 2, rue Casimir-Delavigne, Paris VIe.

CONVALESCENT CARE ON A LARGE SCALE:

THE WORK OF THE BURKE FOUNDATION, NEW YORK STATE.

The Winifred Masterson Burke Relief Foundation, White Plains, N.Y., U.S.A., was founded and endowed by the late John Masterson Burke in memory of his mother. The actual establishment of the Foundation was by his desire postponed until after his own death in 1909, and in 1911 the institutional site at White Plains was purchased by the Foundation trust and work begun upon the grounds and buildings. Standing in 60 acres of land, the institution at present comprises 11 buildings—cottages for men and women, administration and dining blocks, laundry, power house, garage and stable, and superintendent's house—with provision for future extension. The institution was opened in April, 1915, and now holds 300 beds, divided between men, women, and adolescents in various disease classifications. In 1917 the entire facilities of the Foundation were offered to, and accepted by, the Government for military use. In May, 1919, when the Government handed the institution back, it had housed 2000 sick and wounded naval officers, sailors, and marines of the United States and Allied Nations. The review[1] of the work carried out during the two years 1921–23 states that early in this period the post-war reorganisation was completed, and normal institutional work resumed.

Advisory Work and Research Fund.

The Foundation takes an increasing part in the national movement towards systematic treatment of convalescent and " substandard " health conditions, giving facilities for inspection and consultation to those interested in its own and similar work. In 1921 the Frank K. Sturgis Research Fund was established and endowed by the president of the Foundation for the advancement of knowledge of convalescent and preventive treatment. The Fund assists other organisations and publishes and distributes literature dealing with its specialty. The city admission house of the Foundation in New York has become a central information bureau of convalescent and allied welfare ; working with other organisations, the Foundation is thus bridging the gap that so frequently occurs between a patient's return from convalescence and his settling down to some suitable occupation.

Régime of the Foundation.

Full use is made of the grounds at White Plains ; the question of transportation of convalescents has been studied and the value of distant removal proved, both in order to relieve homes and hospitals near the great centres of population and in order to deal boldly with cases which would benefit by such removal. A 25-mile motor-bus ride from New York tests the patient's reserve and adaptability, enabling him to be rapidly assigned to suitable quarters. The following quotation from the report shows the average day of a " progressing " male guest, and is stated to apply fairly to women and girls also, except that the latter play games and walk less.

" Rise at 6.30, no bathing requirements ; walk or sit out ; breakfast 7.30, make bed and tidy room ; morning papers, smoke (no repressions), wash and repair own clothing, go to ' canteen,' library, or barber shop ; play games outdoors and in, walks or light gymnastics ; glass of milk at 10, prescribed occupation 10.30 to 11.30 ; rest, dinner at 12.30, ' rest-hour ' 1 to 2, flat on bed with no talk (longer for weaker ones) ; play in or watch outdoor sports and tournaments, go to village a mile away, or do a few hours of work on farm grounds or buildings if on pay-occupation ; supper at 5, rest, walk, or games, read or write letters, dance and entertainment in assembly, lights out and bed at 9."

All convalescents come before the medical officer at intervals of from one to two weeks, for discharge and other decisions. Emergency medical service is always ready. " Nearly all brought medicines are taken away, as well as crutches, canes, and appliances, at the earliest feasible time. ' Doctoring ' and doctor-thinking is discouraged and replaced rapidly by formative near-normal interests and activities. The narrow drug-list used and the year's small total quantity for 6000 persons incites frequent incredulity. Nearly all begin what would become a series of complaints, but are met by the advice : ' Lie down, have temperature taken, skip a meal.' They are soon seen pointing for the dining-room and in three or four days the fears and introspections are past. Hydro, electro, and like physical therapies are not given, mainly for anti-neurotic reasons and because something better is provided."

Women, it is noted, generally wish to remain too long, and men to leave before recuperation is completed. Emphasis is laid on the importance of judging each case individually, and of taking into account handicaps, chronicity, and conditions of home and employment. Men and women are encouraged to meet in an atmosphere of middle-class social activity. The advantages of giving even the badly crippled a period of change and rest are pointed out, among them being that of temporarily "resting those left at home by taking out a worn and wearing member" of the family.

---

[1] The Winifred Masterson Burke Relief Foundation. Fifth Report, 1921–1923.

Prevention and Specialties.

It is estimated that one-fourth of the adult working population of the United States is in a condition of health sufficiently below the normal to warrant recuperative rest. The Foundation records slow progress in its effort to procure a larger proportion of "preventive" patients, with whom, as a class, results are most satisfactory. With regard to the special conditions treated, 80 beds are set apart for cardiac cases. Mild borderline nervous and mental cases are also taken; over a hundred of these types have already been returned to ordinary life, with a high average of improvement. Cases of lung abscess, hyperthyroidism, chorea, empyema, gastric and intestinal ulcer, "pre-tuberculosis," &c., have been benefited.

Nursing and Surgical Services.

One nurse to four or five infants and small children and, under favourable conditions, one nurse to 50 adults is the ratio of service; this ratio, it is pointed out, has only been attained through a system of generous enlistment of "patient-aid," which is of great therapeutic value to the assisting patients themselves. The actual expert staff consists of a directress, an assistant, three graduate day charge nurses, one nurse in charge of surgical dressings, one nurse for night supervision, and "three 'practical' nurses as aides." The head nurses are allowed to treat and advise medically to a considerable extent, their principal effort being to overcome the frequent desire of convalescents for drugs and medicines. Surgical dressings are made as simply and infrequently as possible and wound-coverings are reduced to a minimum. Convalescents with persistent wounds, sinuses, &c., are sent home to be handicapped wage-earners under private or dispensary care.

Diet, Occupation, Recreation.

Practically all grades of patients from New York City are stated to be "comparatively high and expensive feeders, with an unusual variety of fixed food ideas." At White Plains special dieting is not favoured; a carefully considered standard dietary is given, which results in the correction of many digestive and physical faults. "Obtain the right attitude towards food and exercise and the rest of the normalising process is easy." All patients after a few days of rest are given one or two hours of work daily. The work is prescribed in detail by the physician and is graded from sewing, basket-work, &c., to active gardening and work in the grounds. Women do all the sewing for the institution. "Long stayers" are given "pay occupation"—a modest wage for three to six hours' work about the grounds—and often pass into the regular employment of the Foundation. Recreation includes all manner of indoor and outdoor games, music, dancing, organised walking, &c. The extensive athletic fields of the Foundation are open to the Westchester County High School leagues and other organisations. The value of witnessing good sportsmanlike play is emphasised.

Conclusions Drawn from the Work of the Foundation.

From the eight years of the Foundation's work, covering 10,000 patients, the following conclusions have been drawn by the authorities in charge:—

1. Right selection of patients, keeping to the convalescent and preventive classes, is of the first importance.
2. Individualised term of stay avoids the waste and injustice of a set period.
3. Importance of the play and work and "help each other" therapies.
4. Selected cases of heart disease should be admitted in moderate proportion to all convalescent homes, as well as to special heart institutions.
5. Different ages, classes, sexes, races (with a few exceptions)[2] are successfully treated together.
6. A home-like atmosphere is not desirable; a measure of frank institutionalism, "with its democracy and momentum," gives superior results.
7. These institutions are useful as testing places for the patient's physical and general abilities and fitness for productive life.
8. The seriously ill may be safely returned over long distances in modern motor-cars.
9. More convalescent provision is required for the milder borderline nervous and mental cases, for certain respiratory conditions, for orthopædic cases, and for preventive phas generally.
10. Extension of convalescent facilities throughout t United States is essential for a balanced advance in publ health work.

RIPENING AND ROTTING OF HARD FRUIT.

IN a recent publication of the Food Investigation Boa (Special Report No. 12. H.M. Stationery Office. 4*s.* 6*d* Mr. Franklin Kidd, D.Sc., and Mr. Cyril West, D.Sc., de with the common disease of apples and pears known "brown heart." This consists essentially in the death a subsequent browning of the internal fleshy tissue of the fru while the peripheral flesh generally remains sound. Slight affected apples seen in cross section show small patches on of brown tissue. The disease does not appear external except that to the expert the fruit has lost its characterist springiness on handling. The authors in a long series investigations have shown the relation of this function disease to the atmosphere in which the fruit is store Apples and pears which remain free from blemish wh stored in air, develop this tiresome defect in atmospher containing percentages of CO_2 above a certain danger limi Below this limit the fruit tolerates CO_2 and low O_2 pe centages without injury, and such conditions may be employ to obtain a beneficial retardation of ripening in storag The critical limit of CO_2 content is about 13·6 per cent.

FACTORY GIRLS' COUNTRY HOLIDAY FUND.

To the Editor of THE LANCET.

SIR,—Will you allow us to make a very urgent appeal f the Factory Girls' Country Holiday Fund? Our funds a exhausted, but we have many girls and women anxious hoping for at least a week's rest at the seaside before t winter. The need for this little rest and change is probab more urgent than ever before. Trade depression has result in the girls being the main support of thousands of famili who but for their earnings would be on the verge of starv tion. The general standard of comfort in the average hon is lower than it has been for many years, and the health the community in the crowded and airless factory distric of London has deteriorated considerably. Nor has it be possible for the girls to contribute as much towards a holid as they have done in former years. Good food, rest, a fresh air for a short time will make it possible for many continue their work through the winter, who would otherwi break down under the strain and privation they have h to bear for so many months. The short holiday will gi them fresh hope and courage. Subscriptions and donatio will be thankfully received and acknowledged by t treasurer, Mrs. Rendel, or Miss Canney, 75, Lamb's Condui street, London, W.C. 1.

We are, Sir, yours faithfully,

A. F. LONDON.
ALBERTA SANDWICH.
LOUISE CREIGHTON.
MARY ST. HELIER.
FRANK LLOYD.
F. H. HERTZ,
Chief Rabbi.
ROBERT F. HORTON.

August 23rd, 1923.

MEDICAL ACCOUNT-KEEPING SIMPLIFIED.

To the Editor of THE LANCET.

SIR,—It is generally recognised that members of t profession are not enamoured of account-keeping. May suggest to them an easy method, which I have adopted f some time, and found both simple and time-saving; necessary arithmetic being reduced to the simple form, t compound form being entirely eliminated. By reason of t fact that fractions of sixpence are never used in medic accounts, it becomes an easy matter to decimalise by usi the shilling as unit, and treating the 6*d.* as half-shilling five-tenths. Thus, such amounts as 21*s.*, 10*s.* 6*d.*, 7*s.* 6*d.*, 5 3*s.* 6*d.*, and 2*s.* 6*d.*, become *s.*21·00, 10·50, 7·50, 5·00, 3·5 and 2·50. The ordinary cash columns can be used for t purpose, two only being necessary, the pound column for t integer in shillings, and the shilling column for the fractio All figures to the left of the first figure of the integer natural represent half-sovereigns. Coins of this denomination havi no name, I have adopted for personal convenience the o one of "royal," familiar in Tudor days for this denominatio Pounds not being in the decimal series do not show the selves, but can be seen at a glance if required by mental or otherwise halving the "royals." Thus: 125·50 equa £6 5*s.* 6*d.* This decimal method has the additional advanta of privacy, for no inquisitive stranger would understand t figures, should the cash-book by chance be left lying abou It may be noted that there is nothing in the Coinage or an other Act, to render illegal the keeping or even rendering an account in any denomination we may choose, provided is intelligible.

I am, Sir, yours faithfully,

Chelsea, August 24th, 1923. W. W. HARDWICKE, M.D.

---

[2] "Coloured" convalescent patients are not admitted at White Plains. A small branch home for these patients at Valhalla, N.Y., was opened in 1915 in connexion with the Burke Foundation, but had to be closed after the entry of the United States into the war. Since that time help has been given in the form of recuperation at home and in country houses.

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CONTENTS

THE WHOLE OF THE LITERARY MATTER IN THE LANCET IS COPYRIGHT.

ADDRESS on Extra-ensorial Channels of Knowledge and the Experimental Method. 3y CHARLES RICHET.... 493

ORIGINAL ARTICLES.

linical Contribution to he Ætiology of Actinoycosis. By W. TURNER VARWICK, M.B., F.R.C.S. 497
es on a Limited Outreak of Acute Goitre in Children's Home. By . W. ADAMS, O.B.E., I.D., and H. N. ROSSLEY, M.B., D.P.H. 501
Causes of Headache. By A. B. PAVEY-SMITH, I.C., M.B., F.R.C.S.... 503
Treatment of Scarlet ever by Eucalyptus Oil nd Carbolic Oil versus solation. By G. GUSHUE-AYLOR, M.B., B.S., .R.C.S. 505
tro-Duodenostomy v. astro-Enterostomy in he Treatment of Chronic uodenal Ulcer. By . R. FLINT, F.R.C.S... 508

NICAL AND LABORATORY NOTES.

ase of Acute Myelitis, ith Recovery. By . JOSELIN JAUCH, .R.C.S., L.R.C.P. 510
Unusual Case of hicken-pox. By A. H. OOPER PATTIN, M.D., .P.H. 510
ee Cases of Scurvy. y ROBERT H. NORGATE, .R.C.S. 511

BRITISH MEDICAL ASSOCIATION.

ual Meeting at Portsmouth.

ion of Tuberculosis: rtificial Light Treatent.—Surgical Treatent of Pulmonary uberculosis.—Social spects of Tuberculosis. 511
ion of Ophthalmology: linical Significance of cotometry. — Ophthalology in Relation to e Navy, Army and ir Force 515

REVIEWS AND NOTICES OF BOOKS.

A Manual of Histology. By Prof. V. H. Mottram .. 518
Epidemiology and Public Health. By Prof. Victor C. Vaughan, M.D., LL.D. 518
Les médicins sociologues et hommes d'état. By P. Trisca 519
Loeb Classical Library. Hippocrates. Vol. I. English Translation by W. H. S. Jones........ 519
A Biology of the British Hemiptera-Heteroptera. By Edward A. Butler, B.A., B.Sc., F.E.S. 519
Early Diagnosis of the Acute Abdomen. By Zachary Cope, B.A., M.D., M.S., F.R.C.S. ... 520
Blutkrankheiten und Blutdiagnostik. Von Prof. Dr. Med. Otto Naegeli.. 520
Lectures on the Diseases of the Periodontal Tissues due to Infection in their Relation to Toxæmia. By J. H. Mummery, J. G. Turner, Sir William Willcox, and Prof. E. E. Glynn 520
The Secret Journal of Charles Dunbar. By J. Maconechy 520

LEADING ARTICLES.

THE EARTHQUAKE IN JAPAN................ 521
PASTEURISED MILK 521
PATHOLOGICAL DEPARTMENTS............... 522
THE RAPPROCHEMENT OF HOSPITALS AND CONTRIBUTORS 522

ANNOTATIONS.

The Prevention of Simple Goitre 523
Psychopathology and the Practitioner 524
Syphilis of the Uterus and Adnexa 524
The Tuberculin Dispensary for the Poor 524
The Effect of Industry Upon Health.......... 525
Passive Hyperæmia in the Treatment of Chorea .. 525
Primary Carcinoma of the Ureter 526
Venereal Diseases in New South Wales 526
The late Dr. E. K. Muspratt 527
Some Carrier Problems ... 527
Pruritus of the Anal Region 527

MODERN TECHNIQUE IN TREATMENT.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

XXXV.—The Treatment of Enuresis. By HUGH THURSFIELD, D.M., F.R.C.P. 528

SPECIAL ARTICLES.

Bacteriology of Condensed Milks. A Report to the Food Investigation Board 529
Arsenical Poisoning. The Work of the Swedish Commission 531

PUBLIC HEALTH SERVICES.

Reports of Medical Officers of Health: Edinburgh. —Blackburn.—Hull.—Leicester.—Portsmouth. Preston.—Stockport ... 532
School Medical Service: Cumberland.—Soke of Peterborough 533
Mental Hospitals Service . 534

CORRESPONDENCE.

Heart Disease in Early Life (Dr. Harrington Sainsbury) 534
Decapsulation of the Kidney in Eclampsia (Mr. R. H. Paramore) .. 534
Accidental Vaccinia (Dr. J. Stanley Avery)...... 535
The Foramen of Magendie (Dr. Leonard J. Kidd).. 536
The Status of Pathology (Dr. C. Powell White) .. 536
London Panel: Post-Graduate Courses (Dr. Robt. J. Farman)............. 536
Code Words for Medical Telegrams (Dr. W. Henry Hillyer) 540

OBITUARY.

Ernest Francis Bashford, O.B.E., M.D., Ch.B. ... 536
Edward Alexander White, M.D., M.Ch., L.M.R.U.I. 537

THE SERVICES.

Royal Naval Medical Service. — Royal Army Medical Corps.—Indian Medical Service.—Royal Air Force 537

MEDICAL NEWS

Post-Graduate Teaching in Liverpool 511
Tuberculous Cattle and Black Puddings........ 518
Medical Representation in the New Dail.......... 527
Civil Service Officers: Reduction of Bonus 537
The "Field" Distemper Fund 537

NOTES, COMMENTS, AND ABSTRACTS.

Public Health in Assam .. 539
Health Conditions in Cyprus 540
The Early Days of Lettsom 540
Suspected Cases of Plague and Cholera 540
"Why and Whether in First Aid" 540
An Interceptor for Dental Fountain Spittoons 540
Medical Diary 538
Appointments.—Vacancies 538
Births, Marriages, Deaths. 538

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An Address

ON

EXTRA-SENSORIAL CHANNELS OF KNOWLEDGE

AND THE EXPERIMENTAL METHOD.

Delivered before the International Congress of Physiologists at Edinburgh, July 24th, 1923,

By CHARLES RICHET, LL.D. Edin.,
PROFESSOR OF PHYSIOLOGY AT THE UNIVERSITY OF PARIS.

Mr. President, my dear Colleagues,—I am happy find myself again among you and to affirm once ore my ardent faith in the unity of scientific men all lands, as well as my love for physiology. But e must at the same time show a wider and more ble patriotism in cherishing science, our common other. Therefore, leaving politics on one side, I ill plunge at once into the subject which I venture bring before you.

Although it may appear that I am deserting the assical paths of physiology, this is not really the se. What is our classical physiology if not the arching for truth by way of experiment, of which y illustrious master, Claude Bernard, has established e guiding principles with such authority that it ould be almost criminal not to follow them. To ote his words, "When you enter the laboratory, ave your theories in the hall with your overcoat." But," added he, with a smile, "you will be able to sume them when you go out again." A favourite ying of Pasteur was that it is as necessary to sweep ay the theories which encumber research as it is sweep out the dust every morning from the boratory.

Experiment is continually bringing to nought the ysiology which calls itself classic. When the mortal Harvey demonstrated by decisive experints the circulation of the blood, he upset the classical ysiology of Galen, of Hippocrates and of Aristotle, d aroused the ire of the professors for 20 years. hen Lavoisier showed that life is a chemical enomenon of combustion, he demolished the hazy eas of Stahl and of Willis. When Claude Bernard scovered that the animal organism can manufacture gar, he had against him all the doctors and all the ysiologists. When Pasteur developed the microbial eory of infection he met with formidable opposition. l these men were thus revolutionaries simply cause they had faith in the experimental method, d rejected the popular ideas, the prejudices, the eories and conceptions of their orthodox and stinate colleagues, which were not in accordance th facts, and which were not guided by experiment d observation, both methods equally indispensable the search for truth. I do not claim to rival these r masters, but only to follow the way which they ve led.

The subject of my discourse to-day is very revolunary, and I expect to meet with severe criticism. ıt I would say, in the words of Themistocles: Strike, but listen." Before judging me, hear what ave to say.

The New Science and its Forerunners.

The thesis which I wish to sustain and to prove by experimental method is that there may be a owledge of reality obtained by other means than the ordinary channels of the senses. Everyone ows that the external world is accessible to us by r senses, by vision, hearing, and touch, and to a s extent by smell and taste. No other ways are own. It is the universal opinion that we can have other notion of the reality that surrounds us except ough our five senses, and that any fact must remain ever unknown unless sight, touch, or vision has revealed it to us. This is the classic and at the same time popular idea. It is formal and exclusive, without itself ever having been demonstrated. To admit that a knowledge of occurrences can arrive at our consciousness by any other means than those of the senses, is a daring and revolutionary proceeding, and yet this is the thesis that I am about to maintain.

I am, however, not alone in defending this position. I have precursors and supporters, especially among English men of science. In the first place I would mention Frederick Myers, of Cambridge, one of the most trustworthy and intelligent men that I have ever known; my illustrious friend, Sir Oliver Lodge, Sir William Barrett, the renowned William James, Mr. and Mrs. Sidgwick, the great Cesar Lombroso, my friends Ochowitz, Flammarion, A. de Rochas, Geley, J. Maxwell, as well as the professors Bottazzi, Foa of Padua, Morselli of Genoa, Schrenck-Notzing of Munich, Herlitzka of Turin, all eminent physiologists, as well as many others whom I cannot enumerate here. I am thus not in bad company, and this fact may give me heart of grace to proceed. Indeed, we have not the right to reject summarily the mature opinion of these thinkers, who have all been scrupulous and painstaking experimenters. But I shall not appeal to their authority, nor say: *magister dixit.* I shall rely only upon observation and experiment.

I have tried to find a name for this new science, which though a chapter of physiology, does not make use of its ordinary technique. Just as Aristotle called the science which was beyond physics, metaphysics, so I propose to call this science which goes beyond the ordinary psycho-physiology, metapsychics. I have divided it into two distinct groups—namely, (1) subjective metapsychics, which deals only with the phenomena of consciousness, and (2) objective metapsychics, dealing with the external phenomena which are not explicable by the ordinary laws of mechanics.

To-day I shall not say anything about objective metapsychics and shall confine myself to the psychological phenomena, not wishing to administer to you too strong a dose of revolutionary poison. And even in speaking of subjective metapsychics, I shall say nothing of that strange phenomenon which clashes so violently with all our notions of moral liberty—i.e., premonition, revelation of events which will occur in the future. Though I have a firm belief that such cases of premonition do occur, I shall to-day confine myself to the attempt to convince you that a knowledge of the real world can arrive in consciousness in other ways than through the ordinary channels of the senses. The audacity of my thesis will be sufficient excuse for such limitation of my subject.

Facts of Observation.

As in the study of any other physiological phenomenon, we can proceed by two methods, by observation and experiment. Observation is less fruitful and less demonstrative than experiment. We dare not, however, neglect it. Facts of observation arrive unexpectedly. They cannot be foreseen, nor be dealt with in persons hypnotised or specially sensitive. Ordinary common-sense is sufficient to show that they cannot be explained by mere chance.

The following case is remarkable, not only in itself, but also because it was observed by one of the masters of modern thought, William James.

A young girl, named Bertha, in New Hampshire, disappeared, and it was thought that she was drowned in a neighbouring lake. Repeated search at the bridge and in the lake gave no result. Two days afterwards, Mrs. Titus, an acquaintance of William James, who lived 8 kilometres away, dreamt that she had seen the body of Bertha in the lake at a spot which she localised accurately. A diver descended at this spot and found the body. More than a hundred people had been looking in vain for the body for two days.

Mrs. Green, of London, dreamt that she saw two women whom she did not recognise in a little carriage, and that the horse fell into the water, that two hats floated to the surface, and that the two women were drowned. On awaking, she described her dream. Now at this very moment, at the same hour allowing for the difference of longitude, a niece of Mrs. Green, whom her aunt did not know, in Australia, went for a drive with a friend and was drowned. The two bodies were found, the hats were floating on the surface of the water. The details, which are well authenticated, are so numerous and precise that the law of probability would show enormous odds against such a dream being a mere coincidence.

But of course one cannot raise an edifice on a single stone. There are hundreds of similar cases, and it is especially the English workers who have collected them with zeal and patience.

Mr. Wingfield, on waking on his yacht, sees his brother appear in his cabin, pale and sad. Much frightened, he goes into another cabin and writes in his diary his brother's initials, followed by "God forbid," and the date and hour of the apparition. At the same hour his brother, Richard Baker, was killed while hunting in England by a fall from his horse.

Mr. Smith, employed at a bank in London, comes home after dinner and is talking quietly with his wife. Suddenly he stops and says: "What time is it?" "It is 8.45." "Very well, then Fred has died at 8.45. I have just seen him." It was found that Fred had died exactly at this minute.

Victor Hugo, in his "Choses Vues," relates a similar instance. Mme. Guérin says to her daughter: "I have just seen Mme. Lann pass; she died an hour ago." And it was correct. Mme. Lann had not been at all ill.

Four Possible Explanations.

I could quote a much larger number of similar occurrences, and it seems to me that they are demonstrative. Nevertheless we must discuss them. Four explanations are possible.

1. We might be dealing with defective or fraudulent observations. Now in the larger number of these cases the hypothesis of fraud is inadmissible. Out of the hundred which I might quote there has not been a single one where there has been deliberate falsehood; but their record may have been incomplete and inexact, and this is indeed probable, since in spite of all precautions certain facts have been reported inexactly. If we admit, to be extremely strict, that half of these cases have been inexact, and even with an exaggerated severity we exclude them altogether, there will still remain 50 of which the accuracy cannot be disputed.

2. The second hypothesis is that chance will account for all. Chance is, indeed, a very convenient god, to which we can always appeal. But why should we introduce these extremely small probabilities into our calculations? Practically we never come across a probability of 1 to 100 million, and yet this is the figure at which one must assess the probability of Wingfield having once in the course of his life a single hallucination, and that just the hallucination of his brother being killed at the same moment. Chance will evidently not explain these occurrences.

3. The spiritualists have adopted a much simpler explanation—that the astral body of a dead man returns. Such an explanation does not satisfy me, since many trivial warnings occur, in which there is no question of a death, and because it is generally, if not always, subjective, the phantom being seen only by a single person. Above all, physiology teaches us explicitly that all thought disappears with the death of the brain. Anæmia, asphyxia, intoxication, concussion, and compression of the brain interrupt its activity to such an extent that it is almost impossible for any physiologist to admit that any personality or consciousness can exist when the brain has ceased to function.

4. The fourth proposition is neither an explanation nor an hypothesis but is a simple enunciation of the fact, which is confirmed in a startling manner by experiment, that the occurrences of the external world, even when they do not affect our sense organs, can still influence our consciousness. By what channels I do not know, but the fact is there. Reality comes to us and then the knowledge of this reality takes a symbolic form, as in a dream. The unconscious part of Mme. Guérin is warned that Mme. Lann is dead, and in order to bring this fact to the conscious personality of Mme. Guérin her unconscious se imagines a dream. Hence comes the innumerabl variety of these symbolic dreams, which all tend t the same result—a knowledge of reality, even thoug this knowledge arrives by mysterious and unknow channels.

But however important these observations, whic would suffice alone by their number and precision t make us admit that we are endowed with a hidde form of sensibility, which I call *cryptæsthesia*, there a whole mass of still stronger evidence to demonstrat its existence. It is true that one cannot bring a observation into existence, but one may provoke i Now, an observation that has been provoked, what that but an experiment?

The Experimental Data.

We may consider the experimental data under tw heads: (1) those observed in persons in the hypnoti state or in the so-called spiritualistic trance, (2) tho which have been observed in normal individual Both sets of experiments are equally valid and lea us to the conclusion that, in addition to ordinar sensation, there exists a mysterious hidden sensibilit —a *cryptæsthesia*.

In Hypnotised Individuals and Mediums.

In the first place, in hypnotised individuals or i mediums we obtain unmistakable proofs of clai voyance. I will here record certain experiment which are known to me personally.

Alice has never seen Dr. Héricourt and has never been i his house. Héricourt gives me a drawing enclosed in a envelope carefully sealed. The drawing represents a fra in which he can put a photograph. Now Alice says to me "I see a man—a soldier, with a képi and three stripes on th képi." That was exactly the photograph contained in th frame when Héricourt was drawing the frame alone. Ju think of the number of things that Alice might have said a circle, a cross, a bridge, a sheep, a gun, a horse, a farm in fact, quite a dictionary, and you must acknowledge tha the probability of her saying a soldier with three stripes o his képi was infinitesimal.

My pupil and friend Langlois, whose death three wee ago we deplore, was making an experiment with me in th laboratory. In the evening I asked Léonie, who was at tha time the only person beside myself in my house and who cou not have seen anyone coming from the laboratory: "Wha has happened to Mr. Langlois?" She replied to m brusquely: "He has burnt his hand with a red liqu Why does he not take care when he is pouring it out? T skin was blistered at once." As a fact, Langlois, in preparin a solution of hypobromite of soda, had spilt a pretty lar quantity of bromine on his arm, causing a severe burn.

With Stella I have had convincing results in experimen with one of my friends, G., a clever and sceptical physicia Stella knew neither him nor his family. He asked he "What is the name of my son?" Stella, by means of th table, which he was not touching, replied: "Jean," an added "rit voiture." Now G. had given to his youn son a carriage, with which the child was greatly amuse G. asked again: "What is the name of a brother whom have lost?" Reply: "André." G. said "No," an thereupon Stella said: "André, il vit." Now G. has brother living who is named André.

I gave to Miss Thompson, in presence of F. Myers, m eldest son's watch. Miss Thompson said at once that the was blood on this watch, and she added these words, su prisingly exact: "Three generations mixed." This wat had belonged to an uncle of my son, George, who had be killed in 1870 at Vendome. His father had recovered th watch and had presented it to his grandson, my son Georg Of course, Miss Thompson was ignorant of all the details.

The most striking of all the facts of cryptæsthesi is perhaps the following. In June, 1906, at 10.30 P.M in the presence of two of my friends, Mme. R., b means of table-raps, gets the message: "Banca la mort guette famille." But no one present kne Bianca, for I imagined that Banca stood for Bianc The next day, at 2 P.M., the news arrived at Par of the cowardly assassination of Draga, the Quee of Serbia. At the time I saw no relation betwee

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[1] Or rather Pandja. The dj is a letter peculiar to th Serbian alphabet.

his occurrence and the words given by the raps, but he next day I read in the papers that the father of)raga was called Panca. Without insisting on the etails of this extraordinary occurrence, I will only ay (1) it was impossible for anyone present to know nything of Serbian affairs, and they were totally nacquainted with the names of Draga and her ather; (2) the coincidence of the time is exact to the iinute, 10.30 at Paris corresponding to midnight at ‹elgrade. The warning was given at the very ioment when the officers left their hotel to go and iurder Draga and her two brothers; (3) "la mort uette famille" expresses with amazing precision he blow which was about to strike the family of ‹anca; (4) the family was sufficiently eminent to e able to establish the authenticity of the warning. f in the whole world death was threatening three ersons in any one of 20 families, I could have heard othing of it if it had not been a princely family.

I have tried to calculate the probability of this onderful warning. For the word Panca, it is pproximately $(1/25)^5 \times 1/7$, but for the words "la iort guette famille," the probability is still smaller nd is only about $(1/10)^{10}$. But what does it matter there are two or three noughts more or less? This finitesimal probability gives us a moral if not a iathematical certainty that mere chance can have othing to do with it.

Mrs Piper.

I come now to experiments made by various ıvants on Mrs. Piper. She is an American who has iven the best examples of clairvoyance that I have ver known. Since three thick volumes of them have een published, it is evident that I could only give ere a very meagre summary, and I shall confine ıyself to mentioning the conclusions of the eminent ıen who have questioned and studied Mrs. Piper.

Richard Hodgson, very sceptical, who had already ıade an inquiry in India in order to control the ssertions of Mme. Blavatsky and had concluded that ıere was fraud involved, studied Mrs. Piper for ur years. He makes the following positive statement:—

> "I have brought nearly fifty people to her, after taking all ossible precautions to prevent her obtaining any inforation about these people. They were informed by Mrs. iper of intimate facts which she certainly could not know eforehand. Even detectives were employed to make sure this."

Now William James says:—

> "I am absolutely certain that Mrs. Piper during her trance ıows a knowledge of things of which it is impossible for r to have had any knowledge during the waking stage."

Frederick Myers said:—

> "Messages were given to me and certain circumances indicated, which it was impossible for Mrs. per to have known about. Certain facts enunciated were ppressed in the report as too intimate. Many of these cts could not have been found out even by a clever detective, ıd many other facts could only have been discovered by eans of an improbable expenditure of time and money."

Sir Oliver Lodge says:—

> "Much of the information furnished by Mrs. Piper has t been acquired by ordinary methods. The knowledge at she has of things and persons could not have been rived at by the ordinary channels of the senses."

James Hyslop arrived at the same conclusions after ree years of patient investigations.

Well, gentlemen, if men like Richard Hodgson, mes Hyslop, William James, Frederick Myers, and iver Lodge, affirm, after prolonged investigation, at the normal senses do not suffice to explain the plies and the revelations of Mrs. Piper, we are not titled, without incurring the reproach of unstifiable blindness, to throw their assertions into e waste-paper basket or to consider them on a iori grounds as lying or erroneous.

It is true that in Mrs. Piper's case an explanation s been given which I do not consider legitimate. ıe facts are undeniable. But instead of supposing, I have done, that it is the unconscious intelligence of Mrs. Piper which has obtained this knowledge by channels at present unknown to us, Oliver Lodge, R. Hodgson, and even Myers, have preferred to assume that a human personality—that of a dead person, a spirit—has undergone incarnation in Mrs. Piper, and speaks by her voice, writes by her hand, thinks by her thought. This is the spiritualistic theory, which I cannot accept, even though in this special case it seems to furnish a very convenient and satisfactory explanation.

I do not wish to discuss this here. It is only a hypothesis, a theory, whereas I am resolved to remain on firm ground and not to lose myself in the clouds. Hundreds of positive experiments teach us that Mrs. Piper knows things which neither her sight, her hearing, nor her power of touch could have taught her. I merely adduce this as an authenticated fact, without wishing to pursue the subject further; since the spiritualistic theory rests on a very shaky basis, as, indeed, do all other theories which have been put forward to account for cryptæsthesia.

Three Other Instances of Cryptæsthesia.

Thus, if there were only the case of Mrs. Piper, it would be sufficient to establish the fact of cryptæsthesia (or supernormal knowledge). But there are many others of old or recent date which cannot be doubted. I will only quote three, although I might give a hundred or more.

1. From a villa in the centre of France a botanist starts on a mountaineering excursion; he does not return that evening nor the next subsequent days. Search-parties are sent out, soldiers from a regiment in the neighbourhood explore all the adjacent valleys, but in vain. At the end of a fortnight, a somnambulist, questioned by Dr. Osty, indicates the exact spot, where in fact the body of the unfortunate botanist is found, at the bottom of a precipice.
2. Mr. Myers is visited by a distinguished Dutch physician, M. F. Van Eeden, living at Bussum. Every precaution is taken to ensure Mrs. Thompson's knowing nothing about him, but when in an hypnotic condition, she says that his name is Bussum and that he is a gardener at Eeden. Mr. Van Eeden had brought a piece of a garment belonging to a young man who had committed suicide without informing anyone. Mrs. Thompson gives his Christian name and adds that he had blood on his throat, which is in accordance with the manner of his death.
3. One evening, on July 31st, 1914, in a retired suburb of Paris, Count Ugo Baschier (gifted with remarkable powers of clairvoyance), suddenly remarks while in a spiritual trance: "A very important personage is about to be assassinated; what a quantity of blood. What time is it?" "It is 21.40 o'clock." "Well, something is happening near the Boulevard des Italiens." And, as a matter of fact, at 21.35 o'clock the great orator, Jaurès, was assassinated by an individual who had not divulged to a soul his intention of committing this infamous crime.

Are not these instances sufficient to justify the conviction that there are other ways of attaining knowledge than those through the ordinary senses?

In Apparently Normal Persons.

Further I will adduce other facts, possibly even more demonstrative, since they do not refer to persons in a state of trance or of hypnosis, but to others, still rarer and quite exceptional, who, when in an apparently normal condition, give evidence of second-sight, clairvoyance, cryptæsthesia.

Dr. Chowrin, superintendent of the asylum at Tambow, had under close observation over a prolonged period a woman, Mme. N., who was subject to grave nervous trouble. She could read letters that had been carefully sealed, and written so small that they could not be deciphered without a magnifying glass and enclosed in sensitive photographic paper. It was definitely ascertained on opening the envelope that it had not been tampered with. Before a medical commission Dr. Andreeff writes: "In the sands of Arabia there grew three palm trees, between which flowed a gurgling stream." Mme. N., taking the sealed letter, says: "A vast country, it is sand, three trees, very tall, I have never seen anything like it, a stream of which I can distinctly hear the murmur."

Mr. Resse, a Polish Jew, now in his eightieth year, a naturalised American, has given striking proof of cryptæsthesia before Edison, J. Maxwell, Schrenck-Notzing, Hereward

Carrington. Maxwell writes different questions on seven pieces of paper. Resse did not handle any of these papers, but gave exact replies to the seven questions. On one J. Maxwell had written: "What is my mother's name?" Resse replied: "Mary Angelina," an uncommon name of which he had certainly no previous knowledge. Schrenck-Notzing considers that Resse is one of the most extraordinary men of our time. On five pieces of paper Schrenck-Notzing had written different questions. Resse scarcely touched them and could not possibly read them, but he replied to each question. "What is my mother's name?" "When are we going to Germany?" "What is my eldest son's name?" &c., without any (normal) knowledge of the matter.

Prof. Schottelius at Stuttgart, Mr. Heymans at Groningen, Herr Tischener at Munich, Prof. Lombroso at Turin, all give analogous instances, equally striking.

In Paris Miss Briffaut, without entering into a trance or hypnotic condition, gave marvellous proofs of clairvoyance. My learned friend, the eminent physician, Arnaud de Gramont, pays her a visit under an assumed name. She tells him that his son was called S. . . . and that his name ended in *mont* (Sanche de Gramont), that he was an aviation officer, and that he had been killed, which was unfortunately true. Without disclosing her name, the Marchioness de Montebello goes to see Miss Briffaut, who says to her: "I see L. Louis (Madame de Montebello's son was called Louis). He was killed in the war, it is your son." "No," replied Mme. de Montebello. "All the same, he shows me that he had a sudden death." Now Mme. de Montebello's son had before the war been killed by lightning.

My daughter, Mme. de Ber, goes to see Miss Briffaut, who knows her name. Miss Briffaut speaks to her of my dear son A., an officer in the Flying Corps who was killed in the war, whom she may have known. But she repeated to my daughter an intimate conversation which she had with him two years before the fatal event, and which she had never divulged to anyone.

THE FACTS CANNOT BE DENIED.

Now, my dear Colleagues, these facts cannot be denied. To adopt the weighty words of Sir Oliver Lodge, "to deny them is to belittle oneself with the excuse that they are not in accordance with the principles of that commonplace classical science which we teach." Moreover, with Geley and other learned psychologists, I can myself bear witness to similar facts even still more astonishing and demonstrative if possible. I may quote the powers of a distinguished Polish engineer, Mr. Stephan Ossovietzki, who does not, however, care to make these experiments though he is invariably successful when he undertakes them. In bright light he takes the sealed and opaque envelope offered to him, feels it vigorously without looking at it, presses it, crumples it, and then declares its contents. Neither Geley nor I take our eyes off the envelope and we open it ourselves. We do not know the contents since it was addressed to me by Miss de Noailles, who is not present. Stephan, after taking the letter, says to me: "It is the inspiration of a French poet, perhaps Rostand; they are the verses of Chantecler, recited by the cock. I see the night and the light." Now Miss de Noailles had written: "C'est la nuit qu'il est beau de croire à la lumière. Edouard Rostand." These verses from Chantecler are said by the cock.

My illustrious friend, Sarah Bernhardt, sends a sealed letter to me in Warsaw, which I keep carefully from the moment the postman delivers it to me until I give it to Ossovietzki, who feels it, presses it in every direction, while Geley watches him assiduously, and says: "Life appears humble to us because it is . . . . (a word so French that I cannot read it—a word of eight letters)." Sarah Bernhardt had written: "Life appears beautiful to us because we know it to be ephemeral." I have made drawings which Stephan has reproduced faithfully. One paper he was able to read was enclosed in a leaden tube. Another time I wrote the word "thou" on a paper which I rub into a little ball in my hand. Ossovietzki reads "thou." No cheating had been possible. I am as certain of this as of my own existence, and in order to attest my faith I should not hesitate to condemn a man to death on the strength of it. When a jury condemns a man to death they have less certainty than I have of the genuineness of my experiments.

A NEW CHAPTER IN PHYSIOLOGY.

Gentlemen, I have now laid before you the facts and I venture to hope that your minds will no longe be open to doubt in spite of the novelty of my conclusions. You will agree with me that other mean are open to knowledge than those of the norma senses; that hypnotics, that mediums, or whateve they may be called, exist. We can sometime apprehend truths which neither sight, hearing, no touch can fathom. If I have been desirous o addressing you on these matters in this importan meeting, it is because I consider them to be an outcom of physiology. Yes, it is a chapter of physiology, new chapter which I want to introduce into our classi science. And I think too highly of the wisdom o physiologists to doubt their admission of what experiment has demonstrated. It would be as if they said "I no longer believe in the experimental method. have my theories, and the experiments that yo adduce, however elaborate, numerous, or methodica they may be, have no power to change them."

But you will not commit this sacrilege. You wil forget your theories and you will bow to facts. Fo the facts are there, in quantity, and inexorabl Claude Bernard, the master of us all, did not care fo theories; he established facts and he laughed a theorists who set up against him the vulgar, so-calle common classic opinion. In the same way, whe objection is taken to these exact experiments, to thes minute observations, as being opposed to the ordinar conception, to the opinion of Aristotle, of Locke, Descartes, of Claude Bernard himself, I have th right to smile.

I have often been told that courage was needed t sustain my opinions on cryptæsthesia. This is mistake. No courage is needed to defend truth. O the contrary, courage is needed—a bad courage—t deny the value of experimentation, to throw withou examination into the broad ditch of errors thi formidable weighty collection of undeniable fact more especially since this new physiology will no alter anything in the other physiology. It add something, it destroys nothing. The pneumogastri will continue to stop the heart, strychnine wi continue to produce convulsions, the respirator quotient will have the same number. The fact tha our intelligence perceives unknown vibrations do not modify in any way the laws of sensory perceptio Fechner's law still remains intact.

Perhaps it is not sufficiently understood that the are *contradictory* facts as well as *unusual* facts. Th access (to our subconscious intelligence) of thes mysterious vibrations is an unusual phenomeno but it is a phenomenon which is not in contradictio to anything. It is a new truth, that is all. And th new truth is wonderfully in agreement with th amazing notions which modern physics opens to u At this moment I cannot hear any concert in th hall, nor do you; you might even assert that the are no musical vibrations here. What a mistak If a wireless receiver were placed here, we should a immediately hear a concert that is taking pla perhaps three miles or even 100 miles away. Th receiver proves that the vibrations are present. Th it is with these mysterious paths of consciousness they do not reach us, but they are there. Only sensitive person, in other words, a receiver, is neede to prove their reality. Therefore do not hesitate accept this new fact that unknown vibrations stri an intelligence and bring to it unexpected knowledg

Here is a field spread out for your investigation It is true that the difficulties are great. But whe has difficulty turned us away from the study of an problem? On no account be put off by the credulit of the spiritualists. I do not wish to speak ill of th spiritualists, in spite of their having frequently bee hard upon me. But we do not share the sam principles. I believe only in science, experiment an observation. But they have ready-made theorie They start from the idea that there is a survival the soul and they endeavour to find in the facts confirmation of this conviction. I certainly do no eny that their theory deserves to be examined. In pite of puerilities and absurdities it subsists; although erribly fragile, it often gives a more satisfying xplanation than any other. All the same I cannot ake up my mind to accept it.

ATTITUDE TOWARDS FURTHER STUDY.

Before a theory is established the facts must be xamined. This shall be your task, my dear colleagues. should like to see physiologists of ripe experience ring their powers of careful inquiry to this attractive tudy of cryptæsthesia. They must first read the terature on this subject, and become acquainted ith the experimental methods which we have, among s, initiated, and perhaps invent others. And the arvest will be abundant. For if you have, as I am ssured, faith in science, do not remain shut up in he old structures where too often it is confined. arch boldly forwards. Do not fear light and air. ook around how all is transformed. Physiology as no right to remain a backward science, when her reat sister, physics, takes such a lofty flight. We ow know that there are vibrations everywhere, ven when we cannot directly apprehend them. herefore why not admit that certain vibrations xist which strike the intellect in order to bring to he brain knowledge through this?

Can physiologists and medical men assert that they ave completed the physiology of the brain? that here is nothing further to be discovered about it? nd that they have delimited all the modes of vibration of which it is capable? The brain is a much ore complicated machine than we are wont to onsider it in our innocence. Why may not this arvellous machine be sometimes capable of pereiving vibrations which pass unknown to consciousess? This, my dear colleagues, is physiology. Study his special sensibility of the brain. Give all your ind to this study. According to a formula which s dear to me: Be as bold in hypothesis as you are horough in experiment. At present we understand othing about the phenomenon of cryptæsthesia, and e shall very likely long remain in this condition. But, deed, have we really ever understood anything dequately? Is not everything a mystery, even in he case of phenomena which have been the most tudied and from the earliest times? How does ervous vibration cause the muscle to contract and hen to burn up the sugar? How does light acting n the retina provoke the phenomena—and strangest f all—the idea of light in a living consciousness? ow can two gases in combining give a substance hich is a liquid and yet their atoms continue unhanged? How is it that there are stars whose light akes 30 millions of years to reach us? We understand othing at all of this, yet all this is science. For science as not the pretension of understanding facts, but of stablishing conditions.

To you, my learned colleagues, to you, the young en who are listening to me and who perhaps feel ome confidence in an old man, who, in spite of his ge, is still in love with science, to you all it falls to etermine the laws of this new chapter in physiology. ave confidence in science and do not fear to consider he experimental method as the supreme guide. cience will travel much farther than our stunted cience of to-day. We have sometimes been tempted o think that the facts discovered by our contemporaries were final, and to assign a limit, not very far istant, and a future not very brilliant to our presentay science. Balances, telescopes, microscopes, therometers, galvanometers, always more delicate and ore precise, have been to some degree forming our ery near horizon. But here we may enter a new orld, scarcely explored, before which we stand mazed like a Hottentot before the Hertz waves, the asteur microbes, and Einstein's relativity. This ew world is the unknown, the future, it is hope itself.

I firmly believe that you are destined to penetrate nto some of these mysteries. It will be to the onour of physiology. And more than ever I believe hat great destinies await it.

A CLINICAL CONTRIBUTION TO THE ÆTIOLOGY OF ACTINOMYCOSIS.

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THIS contribution is concerned primarily with the record of two cases of actinomycosis, but inasmuch as they are cases of more than usual interest from the ætiological standpoint, it has been thought worth while to include some account of the hypotheses that have been advanced as to the life-history of the infecting organism, the main arguments that have been adduced in support of each, and the stage of the argument at the present time.

Although granules had been noted as early as 1845 in pus from a case of spinal caries by von Langenbeck (recorded by Israel, 1878), and by Lebert in 1848, the first correct explanation of their nature (a central portion of mycelium with circumferential clubs) was given by Harz in 1876, who investigated the granules obtained by Bollinger from a case of the disease in cattle, and who proposed the name of *Actinomyces bovis* for this parasite. Some years previous to this (1868) Rivolta had also reported on the granules obtained from tumours of the jaw in cattle, though not so accurately as Harz; later on Rivolta claimed priority of discovery, and suggested the name of *Discomyces bovis* (1878). In 1878 Israel recorded the first case in man, and his later researches, and those of Ponfick and others, established the identity of human and bovine infection. Acland was the second observer to demonstrate the lesion of actinomycosis in man. In 1884 Nocard published a report of the first careful study made in France of a mycelial disease in animals. He also, four years later, showed for the first time in that country a case of human actinomycosis. His patient researches into the subject have led, in view of certain objections that can be made against other names, to the attachment by some authorities of the term "nocardia" to certain forms of mycelial disease. When an attempt was made to isolate the mycelium in artificial media, different investigators reported different organisms, and mycelial diseases now known to be quite distinct from actinomycosis were investigated.

The Work of Bostroem and of Wolff and Israel.

For the moment we will only consider the work of two earlier investigators, inasmuch as their results indicate the two conflicting hypotheses with regard to the life-history of the ray fungus, about which there is still controversy. (1) Bostroem isolated from several cases an aerobic streptothrix, easily grown even at air temperature. This, as a result of laborious investigations, he found to be more or less akin to the mycelial parasites which affect grasses, especially in marshy districts. He therefore advanced the theory that the normal habitat of the organism is inside the husks or sheaths of barley and other grasses, and is conveyed from such sources to the mouth, where it gives rise to the characteristic lesion. This theory attracted considerable attention and has become the traditional teaching of the lecture room and text-book. (2) Wolff and Israel reported an anaerobic streptothrix, difficult to cultivate, growing best at body temperature. An alternative hypothesis follows from the results of these careful investigations, which has recently been pushed to its logical conclusion by the work of Homer Wright. It is that the organism is an inhabitant of the mouth (especially in connexion with carious teeth) and of other parts of the alimentary tract, and that in the presence of certain factors, one of which appears to be the presence of a foreign body (even such as husks of barley or blades of grass), is able to invade the tissues.

Terminology.

The inquiry began, as we have seen, around the granules associated with the disease that Bollinger described, but the interest of investigators soon tended to centre round the mycelium. It has been found that when a branching mycelial structure alone without granules is considered, the field of investigation is very much widened. Thus widely divergent diseases have been proved to be due to mycelial organisms, the relation between which is at present a matter for conjecture. Moreover, these organisms have been described and classified from the independent standpoints of the pathologist and the botanist, with the result that the nomenclature in the literature is very confusing. For practical purposes it has been found convenient to limit the term actinomycosis from the clinical standpoint to include those lesions only which present themselves as chronic inflammatory conditions tending to form abscesses and sinuses, from which the typical granules can be obtained. This clinical limitation is open to the objection that the same description would apply to the lesion of madura foot, but in the absence of a definite laboratory grouping, it seems to be the only possible one for the present.

With this limitation in mind, it is only necessary to note the usage of the following terms, their multiplication being due to conflict between pathologist and botanist.

Actinomycosis (*Actinomyces bovis*), suggested by Harz and Bollinger, and used with the above limitation.

Discomycosis (*Discomyces bovis*), suggested by Rivolta, with the same limitation.

Nocardiasis (*Nocardia*) was employed by Toni and Trevisan for the whole group of mycelial diseases, and has been used by others for the non-granule-forming groups.

Streptothricosis (streptothrix) was put forward by Cohn as a generic term, and has been adopted in Cohn's sense by the London Pathological Society.

Coni-streptothrix was suggested by Pinoy as an alternative to streptothrix, a term employed previously by botanists for another organism.

The Granules.

Since the granule is of such importance in the diagnosis of this group, it is necessary to inquire into the structure and significance of the whole and of each of its constituent parts. Typical granules consist of a central matted mass of branching mycelium with radiating club-like structures peripherally. They are easily visible to the naked eye, are of an ovoid or round shape, sometimes yellow, sometimes white, and are usually described as "fish-roe" or sulphur granules. If a little pus suspected of containing granules is shaken up vigorously in a test-tube with distilled water, the granules will, if present, settle quickly to the bottom of the tube, where they may be examined with a hand lens. A molecule of cellular debris in pus may give the appearance of granules, but is not usually so round, and, moreover, it disintegrates fairly readily when shaken up with water, or may not settle so readily. A granule should always be crushed and stained before a diagnosis is made. If crushed between a slide and cover-slip, the structure may be seen with a hand lens to consist of a transparent central portion and a granular opaque periphery. The former contains the mycelium, the latter the clubs (if present), usually surrounded by pus cells. Before attempting to grow the organism, the granules are washed in relays of sterile distilled water.

Significance of the Granule.

The majority of recent researches tend to show that by far the most common organism associated with clinically typical actinomycosis is the anaerobic mycelium of Wolff and Israel. The relation of Bostroem's aerobic mycelium to clinical actinomycosis is not as yet determined. Homer Wright suggests that this observer may have been working with either a cultural or a secondary contamination. An organism closely allied to Israel's gives rise to a lesion which Poncet described as pseudo-actinomycosis. Here the clinical course is less severe and more amenable to treatment, while the granules are supposed to be larger and scantier and the mycelium thicker. This form is aerobic but grows best at body temperature.

Other observers have also isolated different organisms in a small number of cases. Colebrook notes two atypical strains, both giving rise to granules, and suggests the restriction of the term actinomycosis to those cases caused by Wolff and Israel's fungus, and the application of the term para-actinomycosis to the remainder of this granule-producing group. Foulerton has described several pathogenic organisms under the names of *Streptothrix hominis* 1, 2, 3, and 4. He does not lay much stress on the presence or absence of granules, to which the majority of observers attach much importance.

In addition to conditions such as the above, granules have been found in certain bacillary infections: (*a*) Lignière and Spitze described an organism which they called "the actino-bacillus." Griffiths says this bacillus gives rise to the majority of cases of actinomycosis in cattle, but Colebrook found only one case on record of human infection with this bacillus. Foulerton maintains that this organism is really a streptothrix. (*b*) Colebrook found a mobile Gram-negative bacillus causing granule formation in the contents of an abscess in connexion with a tuberculous kidney. This he considered a secondary infection of low pathogenic power.

Branching Mycelium.

This consists of slender threads which show irregular but true branching, and sometimes fragmentation of the protoplasm which gives a faint resemblance to strings of cocci. Such branching forms have been found in many isolated cases of unique pathological conditions, and may frequently be found living as saprophytes in the mouth and other situations. In the granules they occur as a thick felted mass with a general tendency to a radial arrangement, and are stained by Gram's method.

The demonstration of branching mycelium is necessary for the diagnosis of the actinomycosis group (due allowance being made for the tendency of the mycelium to break up), but the presence of this structure alone is not sufficient for the diagnosis in the absence of granules. It is not absolutely settled yet whether this distinction between granule-producing and non-granule producing streptothrices holds rigidly It is quite conceivable that a pathogenic streptothrix may, under certain conditions, form the aggregations of filaments that make up the granules, and under other circumstances fail to do so. Certainly if the organism lives in the mouth as a saprophyte, as the second hypothesis demands, granule formation must be in abeyance.

Certain streptothrices known to be usually saprophytic are frequently met with, the best known being found in the mouth—e.g., Goadby's *Streptothrix buccalis*. Mycelial forms can be demonstrated fairly frequently if smears be taken from the contents of the cavities of carious teeth. It is, however, by no means certain that even those organisms definitely regarded as saprophytes cannot, under certain conditions become pathogenic. Thus, according to Chalmers Goadby's *Streptothrix buccalis* is the same organism as that which Hesse recovered from a case of inguinal and spinal granule-containing abscesses, and to which he gave the name *Cladothrix liquefaciens*. The question then arises: If fragments of branching mycelium are found in any lesion of the mouth, or in any abscess or sinus in the neck, does this necessarily mean that we are dealing with a primary streptothrix infection? The answer is probably in the negative for the other possible explanations of such a lesion are: (*a*) An actinomycotic lesion: It may be that on examining smears from healing actinomycotic sinuses, branching mycelium will be found without granules, while if scrapings be taken from the wall of such a sinus, granules may be found either on lens examination or after histological section. (*b*) A secondary (saprophytic) streptothrix infection. This must be considered when some other specific lesion is present which will account for the onset of the clinical lesion, when no granules are found on scraping, and when the condition heals readily after proper surgical treatment of the original infection. When a leptothrix (non-branching mycelium) is found in association with lesions about the mouth, it is usually believed that this infection is secondary and saprophytic, and it must be remembered that some of the streptothrices of dental origin do not usually appear to be any more harmful than a leptothrix.

I have found mycelial forms in smears taken from a sinus of the cheek in connexion with an alveolar necrosis, and also from a sinus in the neck that had resulted from tuberculous glands. Moreover, scraping from the sinuses showed no granule formation, and surgical measures dealing with the necrosis in the one case, and the tuberculous glands in the other, resulted in cure. In these cases my investigations were limited, as attempts at culture yielded a heavy mixed infection, and no growth of mycelium was obtained. I cannot find any record of cultural observations from such cases in the literature of the subject.

In a research into the mycology of tumours, Leyton isolated streptothrices from many tumours. He did not claim that the streptothrix was the cause of the tumour, nor would many pathologists be found to support such a view. It follows, then, that the streptothrix is an addition to the tumour, perhaps of no great pathological moment. If this conclusion as to the saprophytic nature of organisms found in relation to neoplasms is admitted, it should not be difficult to accept it with regard to those found in sinuses and abscess cavities near places where such organisms are known to exist. Further, Homer Wright is apparently of the opinion that Bostroem, in his historic researches, must have worked either with contaminating cultural organisms, or else with secondary invaders of the lesion. On this second supposition one of the comparatively harmless secondary streptothrices may even be found in a lesion originally caused by actinomycosis.

The Clubs.

It is necessary to state that some confusion has arisen in the use of this term. Thus it has been applied to ball-like swellings that are found on the hyphæ and elsewhere in certain mycelia in culture, and to the peculiar crystalline substance that caps the granule found in the tissues. The former are supposed to be spores, and are not a characteristic of the anaerobic organism of Wolff and Israel. The latter result from the interaction of the mycelium and the tissue fluid, and are believed to be a protective mechanism of the mycelium. They have been obtained in cultures in special media by Homer Wright. These are the structures which are entitled to be called the "clubs" of an actinomycotic granule. They are a marked feature of bovine lesions, but are very poorly developed in actinomycosis in human beings. Homer Wright attaches considerable diagnostic importance to their presence. They are not, however, a constant feature, though they may be found in a high percentage if a careful examination is made. They have been found in other organisms (e.g., tubercle) after an injection of large quantities of bacilli into the tissues. They are, therefore, neither pathognomonic nor a necessary component of an actinomycotic lesion.

Cases.

The following are the cases I have to record :—

CASE 1.—Female, aged 38, quite well until 1919, when, following on dental extraction under a general anæsthetic, she began to suffer from violent fits of coughing. Three or four months afterwards she coughed up a tooth with a large quantity of fœtid material. After this her attacks of coughing became less violent, occurring chiefly in the morning and after moving from a recumbent position. Her sputum was nummular in form and somewhat fœtid, not of the type ordinarily associated with bronchiectasis. She attended the out-patient department of the Middlesex Hospital for some time, and was admitted to the wards because discomfort was increasing and night sweats were profuse.

Condition on Examination.—She presented a somewhat cachectic appearance, and slight clubbing of the fingers was present. The chest revealed dullness on percussion over a large, somewhat tender area at the left base before coughing, while after any attack of coughing which resulted in the expectoration of a considerable amount of sputum, areas of amphoric breathing and bronchophony were to be found.

Streptococci and diphtheroid bacilli were found in the sputum ; an autogenous vaccine was prepared, and a dose of 3 million organisms given. Following on this the temperature rose ; there was a great increase in the amount of sputum, which became more purulent and offensive, and as the pain in the chest increased, the vaccine was discontinued. The next day a fluctuating swelling was noticed between the eighth and ninth ribs in the mid-axillary line. A skiagram of the chest showed increased opacity at the root of the left lung, and over the lower lobe of the lung.

The swelling was incised, found to be a small pointing empyema, and drained. A large quantity of yellowish pus containing small yellow granules escaped. Examination of the granules revealed the presence of a branching streptothrix. All attempts to grow it both anaerobically and aerobically failed, so that a complete report cannot be given. After the administration of potassium iodide (about 60 gr. per diem), the sputum gradually reverted to the nummular form, the operation wound slowly closed, and was giving no trouble when the patient left hospital. The temperature gradually settled down to approximately normal, rising intermittently to 99°, and very occasionally to 100° F. The patient was sent to a convalescent home within six weeks, where her general condition improved considerably. There has been no recurrence of the empyema up to the present, the sinus is completely closed, and her condition seems stationary.

CASE 2.—A healthy vigorous male, aged 22, wishing to join the police force, presented himself in May, 1921, for preliminary medical examination. The left lower wisdom tooth was found to be carious ; all the remainder were then, and are now, quite perfect. This tooth had never caused him any pain, and no sign of disease apart from the caries was noted in the mouth or elsewhere. He was accepted subject to the removal of the tooth.

The extraction took place on August 3rd, 1921, and was followed by some considerable inflammation which gradually settled down. No further discomfort was experienced until November, when he complained of pain all over the left side of the face. Within a week swelling of the cheek was noted. He was admitted in this condition to the Middlesex Hospital, and was found to be suffering from an abscess in connexion with this part of the lower jaw. The abscess was incised and drained, and the pus from it yielded pneumococcus on cultural examination. Later examination by X rays revealed a very much thickened mandible with several small sequestra.

Sequestrectomy was performed in December, and granules were found in the granulation tissue removed ; branching mycelium was demonstrated in the granules. The administration of potassium iodide in large doses was commenced. Several operations have been performed since for the removal of small sequestra. On the last occasion cultural observations were made by Dr. A. N. Kingsbury, who found that the organism began to grow under anaerobic conditions at 37° C. but the culture soon died out.

The condition has made gradual improvement, and there are now two or three scars of healed sinuses in the cheek, while the active area is limited to one sinus leading down to bone, and surrounded by an area of indurated skin of a bluish colour. X rays do not reveal any further sequestrum formation, and the affected area seems to be progressively diminishing.

Clinical Manifestations of Actinomycosis.

The organism invades the tissues through an abrasion, most commonly in a mucous surface, more rarely the skin. The lesion is found generally in connexion with some part of the alimentary tract, usually the mouth or cæcum. Progress of the lesion is at first by local infiltration, and there is a tendency for this to follow fascial planes. Erosion of bones—e.g., the spine—often occurs. The neighbouring glands are involved only by direct spread from the original site. They may, however, be infected by the secondary pyogenic organisms along lymphatic channels. Later the spread occurs by the bloodstream.

The following varieties are usually described :—

Cervico-facial.—Invasion takes place from the mouth through an abrasion of the surface, through a tooth socket in connexion with dental decay, or via the tonsils or salivary ducts.

Thoracic.—This infection may be primary or secondary. Two routes are described in primary cases ; invasion through the œsophagus leading to mediastinal infection, or through the bronchi, leading to pulmonary infection. Secondary invasion may occur either by extension from the liver through the diaphragm, or by metastases through the pulmonary circulation. All these forms tend to spread to the surface of the chest.

Abdominal.—A cæcal infection is most common; it usually commences in appendicitis. An infection of the rectum is also met with, but much less frequently. Lesions of the stomach have been reported but are rare. From any of these sources metastatic abscesses may arise in the liver.

Skin.—Actinomycosis of the skin and subcutaneous tissues as distinct from streptothricosis is rare. Quervain gives several cases occurring in the recent war associated with sleeping on straw. Pringle's classical case of peri-anal actinomycosis seems to point to an infection from straw.

Genito-urinary.—The tubes and ovaries have been affected alone, the route of infection being uncertain. The kidney has been reported primarily affected in about eight cases, but few of these have been due to Woolf and Israel's organism.

Other Situations.—Actinomycosis of the brain and of other organs only accessible by the blood-stream has been recorded in cases where no surface lesion has been found, and infection must have been carried through the blood-stream from some point not ascertained.

I do not propose to attempt to record the clinical course of the various forms. Excellent clinical accounts have been given in France by Poncet, and in England by Kellock and by Cope, both the latter leaning towards the theory of Bostroem, as indeed do most clinicians. Kellock, however, in attempting to account for the various social and occupational conditions of the persons affected, states "that one is compelled to conclude either that the infection has been much more widely spread than was formerly supposed, or else that the organism that is its cause has, like other forms of life, undergone a process of evolution, and changed its locality and habits."

Evidence Favouring Bostroem's Theory.

Finally, the arguments brought forward by the supporters of the two schools can be considered. The arguments in favour of Bostroem's supposition have been ably marshalled by Mattson, and may be presented as follows:—

(1) *Evidence from Cases in Animals.*—After recording the observations of Conn on the preponderance of actinomycosis in the flora of sod-soil, Mattson cites Jensen's record of actinomycosis in endemic form in cattle, especially in marshy districts and in lands reclaimed from the sea. He also recalls the historic observations of Bostroem, who found the remains of grain or its sheath in several of his cases, and of Johne who, whenever he noted barley sticking in the tonsils of pigs, found them covered with a fungus similar to, if not identical with, the ray fungus.

(2) *Evidence of Cases in Man.*—It is usually stated that the disease is more common in those whose occupation entails the handling of hay or straw. Hummel collected 13 cases in German literature of infection associated with a foreign body, usually a piece of barley corn. Soltmann reports a case in a boy of 11, the sequel of swallowing an ear of barley. A thoracic abscess developed which on incision was found to contain an ear of barley and actinomycotic granules. Cope records a case in a boy of 10, who swallowed a blade of grass which lodged in the right tonsil. An actinomycotic abscess developed behind the angle of the jaw, and through the sinus resulting from it a piece of grass was eventually discharged. Mattson himself adds a case of cæcal actinomycosis; further examination of a previously removed appendix revealed a concretion round a grain of wheat, but he does not record the presence of infection in the appendix round the grain. To the above cases may be added those of Quervain and that of Pringle, both mentioned above.

The evidence here is merely circumstantial, and it may be equally well argued that if the organism is already present in the mouth, the damage done by bits of straw which are yielding enough to escape the efforts of the tongue to remove them, is yet sufficient to permit the invasion of the organisms present. Moreover, if chronic sinuses are present in the mouth, it can easily be imagined that bits of straw would tend to lodge in them in the case of herbivorous animals such as cattle.

Evidence Favouring the Theory of Wolff and Israel.

In support of the alternative theory are the following facts and arguments:—

(1) The organism of Wolff and Israel, which has been shown to be the commonest organism isolated from clinically typical cases of actinomycosis, is anaerobic and grows only at body heat. It is difficult, therefore, to understand the connexion between this streptothrix and those found on grasses. As noted above, Wright thinks that even the organisms that Bostroem isolated from the cases he reported were either cultural contaminations or secondary infections of the lesion.

(2) Branching streptothrices exist in the mouth, especially in connexion with decayed teeth, and similar organisms have been found throughout the alimentary canal, least frequently in the acid-secreting stomach. The more easily grown aerobic forms have been isolated and described. It must be remembered, however, that the floral conditions existing in dental cavities and elsewhere throughout the alimentary tract render these situations unpromising sources from which to grow such a delicate organism as the actinomyces of Wolff and Israel.

(3) Lord injected the contents of teeth and tonsil crypts into guinea-pigs, and obtained club-shaped structures round branching mycelium. The objection to the conclusiveness of this experiment is that he did not isolate the organism from the material injected or from the resulting lesion in the guinea-pig.

(4) Clinical evidence of the dental origin of the lesion is not lacking: (*a*) A case recorded by Cope is of interest: The patient contracted actinomycosis as a result of an injury to his knuckles, sustained while knocking out an opponent's tooth; the opponent apparently had no actinomycotic focus. A similar case is recorded in America by McWilliams. (*b*) Cope also records a large central abscess expanding the lower jaw in direct connexion with the socket of a carious stump. The second case reported above, where the lesion followed the extraction of a carious tooth, is also significant. (*c*) Stengel records a case in which actinomycosis followed injury to the cheek by an instrument used in extracting a tooth. (*d*) The case of thoracic actinomycosis (Case 1) reported above also provides equally good circumstantial evidence. A case of thoracic actinomycosis is reported by Israel, in which he found the remains of a tooth in the bronchus. I believe other similar cases have been published, but I have been unable to trace them in the literature.

The main argument advanced by Mattson against this second theory is that actinomycosis never follows on surgical interference in the abdomen or mouth. This argument cannot be accepted lightly; Mattson himself records a case, previously mentioned, in which actinomycosis followed appendicectomy, performed apparently for acute appendicitis, and such cases are not uncommon. It is not often that actinomycosis is suspected at the time of operation for an acute attack of appendicitis. That diagnosis is prompted by the subsequent history. It is quite conceivable that the appendicectomy itself may have been the final cause determining the onset of actinomycosis in a certain number of cases of this type, and the course of events may then be compared to that shown in Case 2 recorded above. In this case it would be difficult to convince oneself that the extraction did not determine the onset of failure of resistance of the tissues.

When the onset has been less sudden and operation is delayed the disease may be found at operation to be definite and established. The course of such cases may be compared to that quoted above (recorded by Cope) of a central abscess of the jaw. It may also be noted here that cases of accidental infection from the gut by *Streptothrix eppingeri* following operative interference are reported by MacCullum and Foulerton;

Factors Determining Invasion.

It has been found by investigators to be very difficult to transmit the lesion of actinomycosis to animals. The general belief is that certain conditions must be present to enable the parasite to gain a hold in the new surroundings. These include such factors as the presence of a foreign body—e.g., straw in the fauces, or of other organisms. The well-recognised onset of actinomycosis after an acute attack of appendicitis is a clinical illustration of the effect of the latter, but a more definite relationship to certain bacteria is also proved by the discovery of bacillary organisms embodied in the granule of which they form the felt. Thus Wolff and Israel described Gram-positive micrococci; Klinger, the presence of Gram-negative cocco-bacilli, *B. actinomyces comitans* (confirmed by Colebrook). Inoculations from pure culture are not successful in producing progressive lesions in small animals, and recent experiments in the direction of determining the necessary combinations of mixed infections have given rather negative results so far.

In conclusion, it appears that most of the direct evidence supports the theory so strongly advocated by Homer Wright. Clinical evidence can at best only be regarded as circumstantial and may be used in support of either theory. The final solution of the problem, therefore, must be sought in the laboratory by cultural and inoculation investigations.

I am indebted to Dr. W. Essex Wynter for permission to publish Case 1, and to the late Mr. T. H. Kellock for permission to publish Case 2.

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NOTES ON A LIMITED OUTBREAK OF ACUTE GOITRE IN A CHILDREN'S HOME.

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In this paper we propose briefly to summarise the salient characteristics of a curious outbreak of acute goitre which ran its course during the earlier months of this year and was limited in incidence to one cottage out of a colony of nine occupied dwellings which constitute with one other cottage, unoccupied at the time, the Children's Cottage Homes in connexion with the Birch Hill Poor-law Institution. These Homes are situate near the village of Wardle and are about four miles distant from Rochdale. Epidemics of acute goitre of greater or less extent have been previously described (McCarrison, Guillaume, Simon, &c.), but appear to be of sufficient rarity still to merit record. Moreover, the causation of such epidemics is, as yet, obscure, and though in the present instance it has only been possible to arrive at certain tentative conclusions, we think that an account of the clinical features of the epidemic ought to be placed on record both in the hope of eliciting the experience of others who may have encountered similar outbreaks and of assisting future observers.

Though the chronic form of goitre seems to be rife among the children of all the cottages (ages 3–15 and of both sexes), the sole brunt of the acute epidemic was borne by cottage No. 3. The inmates of this cottage at the date of the epidemic numbered eight—boys of ages between 4 and 10 years, and all these children were affected. The adult staff of this cottage, consisting of a foster-mother and her husband (resident) and a female cleaner (non-resident) escaped.

There is, unfortunately, no record of the previous thyroid state of these boys, though it is known that one of them, on admission to the cottage some months before, had been observed to possess a distinctly visible thyroid, and it is probable, judging from the results of an examination of the children in the remaining cottages, that another case or two of slight chronic enlargement might have been detected had there been occasion especially to look for it before the commencement of the acute outbreak. However this may be, the course of events is sufficiently striking, as is evidenced by the fact that no other cottage of this colony has, during the period of tenure of the present medical officer (H. N. C.), ever experienced the dramatic thyroid flare-up which was the lot of cottage No. 3.

Outbreak of the Epidemic.

The course and clinical symptoms of the epidemic were as follows: On Jan. 7th, 1923, the boys of No. 3 cottage were inspected during the course of the ordinary routine examination by the medical officer (H. N. C.). Though the examination was not specially directed to any one region, nothing in the appearance of the boys served to draw attention to their thyroids, and no enlargements were noticed save in the case of the boy above mentioned. On Jan. 10th, S. U., aged 9, the boy who had already been noted as slightly goitrous, was seen by the foster-mother to have a very marked goitrous swelling far in excess of the boy's normal fullness in the region of the throat. On the 12th two other boys, T. A., aged 9, and L. G., aged 8, were also noticed to have large thyroid swellings. On the 13th all the remaining five boys presented thyroid swellings, distinct in all, though varying in degree individually. In all the cases the swelling was soft, elastic, painless, and non-inflammatory. The right lobe was invariably more affected than the left, and there were no glandular enlargements elsewhere. In some of the cases there were carotid thrills and enlarged venules over the gland and upper sternum which disappeared later. In no case, however, was there any thrill over the gland itself, nor were any of the signs of hyperthyroidism present. The thrills and congested venules noted were, therefore, probably merely mechanical effects. The pulse was variable, but allowing for age and the psychological effects of the examinations the rate of the pulse seemed in no case to have any special significance. The temperature was normal and remained so always. The general health of the boys was unimpaired. The picture was that of a symptomless acute enlargement of the thyroid gland.

Systematic physical examination of the boys revealed nothing further, save that carious teeth were present in two of them, and some faucial congestion was noticed in five of the eight boys. The bacteriological reports on these throats were negative as regards diphtheria and diphtheroid bacilli, but gave the predominating organisms as streptococci. The lad S. U. (the first case noticed) is a mental deficient. The youngest boy (aged 4) is a sickly-looking lad, but has no definite disease.

Course of the Epidemic.

Such, then, was the state of affairs at the commencement. The further course of the epidemic will now briefly be summarised. The maximum thyroid enlargement appeared to be rapidly attained in a few days, and after a period varying between five to seven days, the thyroids began to subside, so that by the seventh day appreciable diminution was noticeable in all the cases. This subsidence continued, though not without fluctuations, for about a fortnight, after which a stationary period occurred, during which it was difficult to detect, either by measurement or otherwise, any appreciable change. By Feb. 1st, however, one of the cases, at least, was considered to have returned to normal. After this date progress, though slow, was more readily appreciable, and by March 6th the thyroids in three of the boys would not have attracted attention, while in four of the others the thyroid enlargements could only have been described as "slight." In only one boy of the eight would the condition of the thyroid at once have arrested the attention of an observer at the first glance. During the period Feb. 1st to March 6th a diminution of as much as 2 inches in the neck circumference was observed in the boy S. U., while in another boy a subsidence of 1 inch was recorded. The remaining cases showed decreases varying from half to three-quarters of an inch.

Slow but sure progress continued to be made, and by April 8th there was room for difference of opinion as to whether the thyroids could now be considered to be enlarged in five of the boys; in two the goitre was classified as slight, and the boy S. U. showed a further diminution in neck circumference of half an inch (making 2½ inches in all since Feb. 1st). His was the only case at that date where the enlargement was at all obvious, but it was considered probable by the observer (H. N. C.), who was in a position to compare his state before and after the epidemic, that he had returned to his former condition. The last joint examination of the cases was made by us on May 22nd. The condition as regards the thyroid swellings, save in the case of S. U., was not appreciably different from that described on April 8th—that is to say, in two of the boys there was still slight goitre and in five the thyroids might be described as normal.

We think that the thyroid state of the inmates of No. 3 cottage does not now materially differ from that existing in many of the other cottages where no acute epidemic has occurred, and where a similar proportion of cases of slight goitre has been detected. We therefore suppose ourselves justified in assuming that the acute epidemic in this cottage may be considered to have come to an end, and that the residuum may be regarded as the state which would probably have been found had attention been specially directed to the thyroids in the children of this cottage prior to the occurrence of the epidemic.

As regards the boy S. U., the thyroid was slightly larger than at the examination on April 8th. These fluctuations in chronic goitre are not uncommon. (The goitre in this boy, however, subsequently rapidly returned to the condition described on April 8th, and has remained in that state up to date —August 16th. No change in respect of the other children has occurred since the last note.—H. N. C.)

Ætiology.

As we have no desire unduly to prolong this paper, which is written mainly with the object of putting on record the physical characteristics and clinical course of the epidemic, the results of some rather laborious inquiry to ascertain the cause of the outbreak will only be stated baldly and briefly. This is the easier done since, unfortunately, the results of such inquiry are mainly negative.

There is nothing notable in the previous health of the boys of this cottage, except that there had been a slight epidemic of measles among them which occurred in the early part of December, 1922. Three of the boys suffered, but all had completely recovered by the date of the goitrous outbreak. There had been no cases of mumps, scarlet fever, diphtheria, or other infection on tracing the records back for several months. The faucial congestion found in five of the boys at the early examinations has already been noted. Besides what may be termed the permanent population of this cottage, a certain number of children pass through it on probation before allotment to other cottages, thus constituting a sort of floating population. Two children so passed through near the date of the epidemic—viz., a girl, E. L., aged 13, and her brother J. L., aged 10, who were admitted on Dec. 30th, 1922, and stayed seven days, leaving on Jan. 6th—i.e., four days before the first case of acute goitre was detected. E. L. was found to have a slight goitre, which, however, had been present some time and was probably due to physiological causes. J. L. was goitre-free. The adult staff were found healthy, the only illness recorded recently being a slight attack of influenza, from which both the foster-mother and her husband suffered. Among the inmates of the other cottages, recent illnesses included one case of measles in each of two cottages, one case of scarlet fever which was promptly sent away and gave rise to no further cases, and some trivial and ephemeral complaints of no import. The children of the various cottages come into contact at play, on the way to school, and so on.

As regards the immediate neighbourhood, goitre is endemic in the district, according to the view of Dr. D. McGill (medical officer of health, Wardle), but there is no consensus of opinion that the goitre incidence is really higher in any part of Lancashire than in most other districts. Inquiries made in the schools of the area showed, however, that goitre, usually of a slight or moderate degree, was not uncommon among the children. In these inquiries we received very valuable assistance from Dr. J. J. Butterworth (M.O.H. and School M.O., Lancs County Council, &c.) and from Dr. W. M. Ash (Assistant County M.O., Lancs, and School Med. Insp., Lancs), who examined the thyroid states of 249 school children attending schools in the neighbourhood and compared the results with those found in 83 of the cottage children who comprise the population of the cottages other than cottage No. 3. Dr. Ash's figures show 33 cases of thyroid enlargement of varying degree among the 83 cottage children as compared with a total of 30 cases among the 249 school children. These are significant figures, and at least show that there is some abnormality in what we may call the thyroid soil of the cottage children generally. It is of some interest to compare these figures with those obtained by Dr. C. N. Atlee in an investigation into the prevalence of goitre among children under 12 years of age in the South-Eastern quarter of London. Seventy-seven cases were found among the 1839 children examined.[1] No other cases of acute goitre were, however, encountered, with one doubtful exception.

As regards other illnesses, measles seems to have been the only prevalent affection recently among the children of the surrounding neighbourhoods. The state of affairs, therefore, seems to be that though there is a case for inquiry whether goitre is or is not unduly prevalent in the area around Rochdale, there is no doubt that a high degree of thyroid instability is present among the children of these Homes generally, and that some special factor (or combination of factors) has acted as a detonator to explode this unstable material in cottage No. 3.

We feel justified in saying little more than this at present. Neither the general cause of the endocrine instability nor the special factor which produced the explosion in a particular cottage emerges at all clearly. On the general point it may be said that the cottage buildings, though sound and comfortable, are not, perhaps planned to give the maximum amount of light and ventilation, and it is possible that experience may show that some revision of the diet and régime may be advantageous. But chemical and bacteriological examinations of the water and milk have so far afforded no real clues, nor have other inquiries which cannot be detailed here.

We are just as much in the dark as to the nature of the spark which ignited the material in one special cottage. So far as possible all the contacts of the cases have been traced and examined, but no definite results emerge. The conditions of life in all the cottages are the same. The water-supply and milk-supply are the same for all. The dietary is the same; the food is obtained from the same sources of supply. The sewage disposal is on one plan. The cubic space and floor space per boy in the No. 3 dormitories do not materially differ from those for the children in the other cottages. Careful measurements have been made in all these respects and these are the general results. The inmates of the affected cottage appear to get as much light, air, and exercise as the inhabitants of the other cottages, and the past general health of the boys of this cottage appears to have been at least equal to that of the children of the remaining ones, with the exception of the measles epidemic. But though only three of the eight children in cottage No. 3 had measles, this fact, coupled with the condition of the fauces in the majority, may have some significance, and may possibly mean that the special factor must be looked for in some form of infection. This appears to be all that can usefully be said at the present moment in the matter of the ætiology, though we are not without hope that some more definite statement may be possible at a future date as the result of continued observations.

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[1] See Annual Report of L.C.C for 1922, pp. 55–56.

THE CAUSES OF HEADACHE.*

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HEADACHE may be associated with almost any form of illness; it may be so trivial and so persistent as in time to be regarded almost as normal; it may be so severe as to make life nearly intolerable; and there is hardly a symptom so common and at the same time so little understood. It presents no outward and visible signs. Our knowledge of its character must depend almost entirely on the patient's statements, and in a large number of cases we can only conjecture what is the actual process which causes the pain. But without some such conjecture, without some sort of mental picture of the origin of the symptom, its treatment can be little more than empirical and haphazard.

The classification of headache in most works of reference is, to my mind, entirely unsatisfactory. It consists in most cases of a partially classified list of conditions with which headache is associated, and nothing more. It gives no hint of how the headache is caused. For instance, "headache due to toxic causes" may be a useful pigeon-hole, but it conveys no very clear idea. I suggest a different classification, dividing headache into three main groups, as follows: 1. *Intracranial,* due to actual processes occurring within the cranial cavity. 2. *Cranial,* due to processes affecting the cranial walls and the air spaces contained within them. 3. *Extracranial,* due to processes affecting structures outside the cranial walls. By "process" is meant the actual organic condition directly responsible for the head-pain. Thus, in an intracranial headache (Group 1) the pain arises as a result of some intracranial change. This intracranial change may itself be due to some extracranial and more general condition, but the headache is only "extracranial" if the actual pain-causing lesion is outside the skull. These groups, in fact, refer to the starting-point of the pain, and not to the condition with which that pain is associated.

Intracranial Headache.

The intracranial group has two main subdivisions: (*a*) cortical, and (*b*) dural.

(*a*) *Cortical.*—This subdivision includes all headaches arising in the cortex. Almost all these may be classed as purely functional. They are due to exaggerated activity of that part of the cortex concerned with the sensation of the headache area. This form of headache may be the product of a perverted mental process without any organic lesion, and is usually associated with other symptoms of a hysterical nature. True migraine is also probably of cortical origin, the exciting cause being unilateral. Headache due to organic changes in the cortex *and arising* in the cortex must be rare. The cortex itself is quite insensitive, and the only organic process capable of producing a cortical headache must be one which stimulates exclusively the pain-perception cells connected to the painful area.

(*b*) *Dural.*—This subdivision probably accounts for he majority of headaches. Headache of this class is due to irritation of the nerve-endings in the dura mater. The cortex and cerebral tissues themselves have frequently been demonstrated to be quite insensitive; he inner lining of the skull, on the other hand, is well upplied by branches of the trigeminal and other ranial nerves, and in certain areas pacinian corpuscles are present. Moreover, the dura is homologous to periosteum, which is known to be pain-sensitive. The headache originates in the dura, the nerve-endings of which are irritated by pressure or inflammation. Anything which raises the intracranial pressure may hus produce a headache: (1) Cerebral hyperæmia and erebral œdema account for such headache as accompanies acute fevers, asphyxia, renal disease, toxæmias whether bacterial or otherwise, and many head injuries; (2) increase of cerebro-spinal fluid; (3) mass increase of cranial contents, by tumour, abscess, gumma, extravasated blood, &c. Any of these may produce pain by pressure on the dura in the absence of any inflammatory irritation of it. In a similar way, headache may result from inflammation of the dura acting alone, whether localised or general, acute or chronic. But the dural nerves appear to be far more susceptible to pressure than to inflammation. The intense headache of cerebro-spinal fever is immediately relieved by lumbar puncture, though in many cases the dura remains all the time in an acutely inflamed state. Headache of this type may arise in other conditions where these two factors, pressure and inflammation, are combined—whenever, in fact, pachymeningitis carries with it a high intracranial pressure. The importance of raised intracranial pressure as a cause of headache has been proved frequently. The severe headache of pituitary tumour is relieved by decompression, that of meningitis by lumbar puncture. Reports on head injuries during the war showed headache to be more severe in, and more particularly associated with, those cases in which the skull was intact, while cases of much more extensive trauma with exposure of the cranial contents were relatively free from headache.

Little is known about the regulation of intracranial pressure, as regards either blood-supply or production and absorption of cerebro-spinal fluid. It is reasonable to suppose that headache associated with a high systemic blood pressure, such as that of chronic nephritis, may be relieved as a result of lowering the blood pressure. At the same time it is quite as possible that the cerebral congestion is due to the action of toxins of intestinal or other origin, and that depletion cures the headache by removal of the toxin. Headaches of this type—high-pressure headaches, in which there is no intracranial inflammation—tend to be dull, and are increased on lying down; they are relieved by anything which lowers the pressure; if intermittent they do not tend to recur constantly in the same place; they are not accurately localised.

I think it possible that in the great majority of cases in which headache occurs as one of several symptoms, as part of a recognised syndrome, or as one feature great or small in some general condition, the headache is of this type—that is to say, it is due to irritation of the dural nerve-endings from increase of intracranial pressure, general or partial, transient or progressive. The headache which occasionally follows lumbar puncture appears after this a paradox; but, unlike most forms, it is relieved by lying down and made worse on sitting up. It is almost certainly due to pressure of the brain on the tentorium and basal dura owing to lack of the supporting fluid cushion. One form of headache met with in anæmia resembles this; it is possibly due to a diminished secretion of cerebro-spinal fluid.

It will be obvious in the light of clinical experience that the pressure explanation of headache is inadequate. There are unknown factors which determine the relation between the severity of the headache and the degree and direction of the pressure. Time is one of these factors. An increase of cranial contents arising slowly, as in cerebral tumour, may reach a higher level before headache is produced, as the tissues have time to adapt themselves. In the case of the rapid increase from active or passive congestion headache is likely to arise sooner, the inelastic walls of the cerebro-spinal system having had no time to stretch. It is also probable that some areas of dura are more sensitive to pressure than others.

Cranial Headaches.

The cranial group includes headaches due to disease of the cranial walls, and may be classified in two main subdivisions: (*a*) disease of the cranial bones, and (*b*) affections of the nasal sinuses.

(*a*) Chronic osteitis of the skull, such as occurs in the common extensions of middle-ear suppuration, is not often associated with headache. Indeed, in chronic otitis media, headache, other than the frontal "intracranial" type which may be associated with any septic absorption, should be regarded as a danger signal. It is almost always due to the disease reaching the dura with the production of an extradural abscess. Such a headache is not usually very severe; it tends to continue, showing little variation, and is fixed to a definite place, over which there is usually tenderness to deep pressure and percussion.

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* A paper read before the Harrogate Medical Society.

(*b*) The nasal sinuses are a much more prolific source of headache; the very intimate relations of the frontal, ethmoid, and sphenoid sinuses to the interior of the skull, and the fact that all these cavities are in communication with the nasal passages, are open to the same infections, and are lined by a sensitive mucous membrane, make it surprising that headache is not more universal. Headache arising from a nasal sinus is due, in almost all cases, to inflammation of the lining and pressure. The latter is, again, as in "intracranial" headache, the important factor. It is *retention* of secretion which causes the pain. For this reason the headache bears no direct relation to the severity of the infection or inflammatory process. A mild catarrhal sinusitis producing clear mucus may cause a severe headache, while a profusely suppurating sinusitis with destruction of the mucous lining may be painless. The determining factor is the efficiency of the outlet. This applies to *chronic* sinusitis; it is probable that no acute sinusitis is painless.

The openings of the nasal sinuses are small. This fact accounts for the relative infrequency with which infections of the nose reach the sinuses; but, at the same time, it has the result that a small amount of swelling is sufficient to close the opening and cause retention. Several of these ostia, again, are situated in a part of the nose so narrow that a very slight degree of deformity will prevent efficient ventilation and favour an inflammatory process around the opening, which is already at a disadvantage. This is particularly the case with the frontal sinus, of which the narrow tubular opening lies under cover of the middle turbinate. If the latter is swollen, hypertrophied, or pressed outwards by a deviated septum, the opening may become closed. Such a closure may cause headache without any true infective sinusitis. The air in the sinus becomes absorbed and a partial vacuum results. This gives rise to congestion of the lining with frontal headache and tenderness; the condition has been described by Sluder as "vacuum frontal headache." A headache of this type is supraorbital, usually unilateral, worse in the morning, and increased by close work with the eyes; the last symptom is due to the pull of the superior oblique muscle on the trochlea which is attached to the thinnest part of the floor of the tender sinus. The ethmoid and sphenoid sinuses communicate with the nasal cavities through comparatively simple though small orifices, and not by a tubular or grooved opening like that of the frontal sinus. This simpler type of opening, from its smallness, can easily become blocked by inflammatory swelling of its edges, but is not affected by lateral pressure, such as results from nasal deformities and causes closure of the frontal sinus. The latter is susceptible to both forms of attack, and this is one of the important factors which make a frontal headache the commonest clinical variety.

Nasal sinus headache has certain characteristics. It is frequently the only symptom, the patient being otherwise in good health. In acute sinusitis it may be neuralgic in character or intense and throbbing. In more chronic cases it may take any form, including that of a sense of uncomfortable pressure from without. It tends to be localised to one area, and, if recurrent, the same area is affected each time. Anything which increases the congestion of the lining immediately increases the headache. Thus the patient may have discovered by experience that stooping to pick anything up is accompanied by the most acute pain. The same applies to coughing, and, to a certain extent, to jarring movements. Periodicity is a very marked feature. The pain is usually worse in the morning. In connexion with this fact it must be remembered that the frontal and sphenoidal sinuses drain by gravity in the erect position only, and consequently tend to fill up during the night. This morning pain is so definite and punctual a feature that it has been called "sun-pain," from a mistaken idea that the heat of the sun was the cause; cases have actually been diagnosed as malaria from the regular recurrence of the headache. There is a general tendency for the pain to come on suddenly, to reach its maximum rapidly, and, after a variable period, to vanish with equal suddenness.

As regards position, a sinus headache is usually unilateral—the opposite to "intracranial" headache. In the case of the frontal sinus it is referred to the supraorbital region, and is associated with local tenderness, especially of the floor under the inner third of the supraorbital margin. With the deeper sinuses, ethmoidal and sphenoidal, localisation is by no means so definite. Sphenoidal pain is referred to the temporal regions, the occiput, or the vertex. In the last position the "heavy weight" sensation is not uncommon; a fact which must be remembered before a diagnosis of *clavus hystericus* is made. Pain arising in the ethmoid may be referred to the back of the eye or the region of the inner canthus. Some of these features occur, of course, in headaches of intracranial origin. They are not in themselves definite evidence of sinus mischief; nor are they by any means essential to a case of sinusitis.

The following points, in a case of headache, should arouse a suspicion of the pain being due to sinusitis:—(1) If the headache is unilateral, and especially frontal; if it shows a marked periodicity; is worse in the morning; has a sudden onset; always recurs in the same place; and is immediately greatly increased on stooping, then a sinus should be suspected. (2) If, in addition, there is a history of "catarrh"; if the nasal airway is defective on either side (and patients may be quite unaware of this); and if the patient is otherwise in good health, sinusitis is still more likely. (3) Finally, if the headache is relieved by inhalations of steam, medicated or not, it can be definitely concluded that its source is in the nose.

There is, in addition, a type of headache due to what I should like to call the "excitable nasal sinus." Such a sinus is one which, under ordinary conditions, gives rise to no trouble, but which, owing to structural variations or to a slumbering sinusitis, "flares up," as it were, on the slightest pretext. Many cases of menstrual headache which are frontal and unilateral are undoubtedly of this type. The same condition is also probably at the bottom of many similar headaches which come on with fatigue, constipation, toxæmia, and other systemic conditions.

Extracranial Headache.

The third main group, the extracranial, includes those cases in which, as I imagine it, during the course of the headache the cranial contents and cranial walls are in a perfectly normal condition. The following types of "extracranial" headache may be briefly considered:—

Ocular Type.—These headaches are due to fatigue of intra- and extra-ocular muscles, generally from errors of refraction; from increased intra-ocular tension, inflammation, and other causes. They are usually worse in the evenings, the opposite to nasal headache. The pain is referred along branches of the trigeminal nerve, usually to the frontal and temporal regions; but it may be occipital.

Dental Type.—These are referred headaches of dental origin. In the majority of cases referred dental pain, as distinct from actual toothache, is found over face areas, but the upper incisors may give rise to frontal headache.

Nasal Type.—Pressure of the middle turbinate against the septum has been advanced as a cause of homolateral frontal headache, but it is common to find the middle turbinate in close contact with the septum, and a total absence of headache. I think it much more probable, in the light of Sluder's work on the vacuum frontal sinus headache, that the pressure of the turbinate against the septum is not the important factor in producing the pain, but that such a state of things is keeping up one of the forms of frontal sinusitis.

Ganglionic Type.—The sphenopalatine ganglion (Meckel's ganglion) lies, covered only by the nasal mucous membrane and a little areolar tissue, just behind the middle turbinate. It has intimate connexions with the fifth and seventh cranial nerves and the sympathetic, is more superficial than any other ganglion in the body, and is exposed to nasal infections. If this ganglion become inflamed it gives rise to the sphenopalatine syndrome, one symptom of which is headache of the very characteristic type described by Sluder as follows :—

> "A coryza of variable severity, followed in a short time by pain at the root of the nose, in and about the eye, upper jaw and teeth, extending back to the temple, about the zygoma to the ear, causing earache, emphasised at the mastoid, but always severest at a point 5 cm. behind this ; thence back to the occiput and neck ; it may extend to the scapula and shoulder, and in severe attacks to the arm, forearm, hand, and even finger-tips."

Half a minim of saturated cocaine solution applied over the ganglion stops all the symptoms immediately.

The Author's Schema.

Every headache, then, falls into one of these three main groups, and I suggest that this classification may lead to a clearer comprehension of the symptom.

1. *Intracranial.*

A. CORTICAL.—*Headache arising in the sensory cortex.*

(1) *Functional*—e.g., hysteria; neurasthenia ; migraine (hemicrania).

? (2) *Organic.*—? Disseminated sclerosis.

B. DURAL.—*Headache due to irritation of nerves of dura mater.*

(1) *Intracranial Pressure*—

(*a*) *Raised* by :—

(i.) Hyperæmia.

(α) Active—e.g., head injury ; fevers: nephritis ; bacterial toxæmias ; fatigue ; reaction after syncope ; meningitis ; constipation ; menstrual and uterine poisons (lead, alcohol, &c.), anæmia.

(β) Passive—e.g., asphyxia ; morbus cordis.

(ii.) Cerebral Œdema.—Head injury ; sunstroke.

(iii.) Increase of Cer.-spin. Fluid.—Hydrocephalus ; meningitis ; head injury.

(iv.) Increase of Cranial Contents.—Tumour ; cyst ; gumma ; abscess ; extravasated blood.

(*b*) *Lowered* by deficiency of C.-S. fluid ; *headache due to pressure of unsupported brain on basal dura and tentorium.*

(i.) Leakage.—Lumbar puncture.

(ii.) Hyposecretion.—Anæmia.

(2) *Inflammation.*—Pachymeningitis—localised suppurative meningitis ; subdural abscess ; G.P.I.

2. *Cranial.*

A. BONE DISEASE.—*Headache due to irritation of periosteal or dural nerves.*

Osteitis.
Periostitis.
Extradural Abscess. } —e.g., infected fractures ; extensions of otitis media ; syphilitic necrosis.

B. NASAL SINUSES.—*Headache due to irritation of nerves in mucosa lining.*

Sinusitis and Retention.—Headache without other symptoms or with nasal catarrh or obstruction.

"*Excitable*" *Sinus.*—Constipation ; toxæmias ; menstrual.

N.B.—Pain arising in the middle ear and mastoid is not ncluded under "headache."

3. *Extracranial.*

Headache due to irritation of nerves or nerve-endings outside the cranial wall, and referred.

(1) *Ocular.*—Muscular fatigue—Errors of refraction.
Hypertension—Glaucoma.
Inflammatory—Iritis.

(2) *Dental.*—Fronto-nasal headache referred from upper incisors—Dental caries.

(3) *Nasal.*—Pressure on septum—Headache with nasal obstruction.
Meckel's ganglion inflammation—"Sphenopalatine syndrome."

(4) *Neuralgic.*—Irritation of branches of fifth or other scalp nerves—Trigeminal neuralgia ; cervical caries (occipital).

(5) "*Rheumatic.*"—Inflammation of muscle or aponeurosis of occipito-frontalis — Myositis ; "muscular rheumatism."

Headache of extracranial origin may be part of a rigeminal neuralgia when this is due to some irritant cting on the fifth nerve outside the skull, or may ccompany any process which causes a neuritis of he scalp nerves. Pain of this sort differs from nost other forms of headache in being sharp and radiating. It is accompanied by a superficial tenderness along the course of the affected nerves.

Summary.

To recapitulate, these three main groups based on anatomy correspond with three main clinical varieties typified in the following three examples :—

In supraorbital neuralgia (Group 3, extracranial) the patient complains of a pain which shoots upward into the forehead, and the maximum tenderness will be found over the nerve. Pressure near the supraorbital notch will increase the severity and area of the pain.

In supraorbital frontal sinus headache (Group 2, cranial) the pain is fixed, dull, and may be throbbing ; the maximum tenderness is usually on the floor of the sinus under the inner third of the supraorbital margin. Superficial tenderness is not so marked, and pressure over the supraorbital notch has no definite effect.

In supraorbital headache of intracranial origin (Group 1) there is no tenderness, though there may be hyperæsthesia to finer skin tests.

That is what I believe to be the "anatomy of headache." It does not rest on definitely proved facts, but it is put forward as a useful working hypothesis.

THE TREATMENT OF SCARLET FEVER BY EUCALYPTUS OIL AND CARBOLIC OIL VERSUS ISOLATION.

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MY experience of scarlet fever extends over two periods : from 1910–11 as resident medical officer at Her Majesty's Hospital, Dr. Barnardo's Homes, then under the supervision of the late Dr. Robert Milne ; and from July, 1920, up to the time of writing, as one of the medical officers of the Homes. During the former period the treatment of the disease by inunction of the skin with eucalyptus oil and by the application of 10 per cent. carbolic oil to the tonsils and pharynx was accepted without question. The number of cases then seen was less than six. During the past three years, as a result of experience of over 280 cases, I have been led to reject this method. This finding has been for me a most unpleasant one, because it brought me into opposition to a mode of treatment instituted by an honoured personal friend ; for several months before his lamented death we had been in communication upon the subject, and I had hoped that at the close of one year's treatment by isolation a joint pronouncement could have been made. I should now prefer not to enter upon a discussion of such a nature, but am impelled by the following considerations. I have been repeatedly asked by medical officers of health and others for an opinion on the treatment ; the three years' records in my hands contain facts of vital public interest ; the method which has failed in my practice is still being used by others, as at Tottenham and Heston,[1] and only by the collation of records of cases and epidemics can truth be elucidated. The late Dr. Milne[2] has written : "Of course, if the new mode of treatment proposed will not stand the severest tests, the sooner its failure is declared the better." At a meeting of the Epidemiological Section of the Royal Society of Medicine the chairman read a note from Dr. John C. Thresh[3] expressing his opinion : "The enormous pecuniary and other advantages which would accrue to the community if Dr. Milne's claims were substantiated, as he believed they could be, led him to hope that some means might be devised whereby the treatment could be tested under conditions which would render the results conclusive." Such statements as the above have encouraged me to investigate the treatment. The results here recorded have convinced me that the claims made cannot be sustained, and have led me to agree with the criticisms of Dr. E. W. Goodall,[4] one of which is that it has not been shown that the eucalyptus treatment has anything to do with the loss of infectiousness.

During the past 50 years the virulence of scarlet fever has steadily declined, as evidenced by the drop in fatality from about 700 per million of living persons in 1871 to 40 per million in 1921. During this period great advances have been made in public health and hygiene which have a bearing upon rates of mortality. Any imagined benefit seeming to accrue from a specific treatment of the disease during this period may be accredited to the treatment without recognising the fact of diminished morbidity. In my opinion the supporters of the eucalyptus treatment have fallen into this error.

In what follows I give considerable detail, so that the reader may be able to follow clearly the steps by which conclusions have been reached.

The Girls' Village Home, Barkingside, where the cases occurred, stands in its own grounds of 64 acres, and consists of 67 cottages, of which 63 are occupied by children, each in charge of a foster-mother. The accommodation of the cottages varies: most of them have 16, 20 or 25 girls each, there being a smaller number with 12 and 9 girls each. Excluding the receiving house, accommodating 50 girls, and one cottage of 20, used as an accessory receiving house, the population of the village is—

Children under 5 years of age	12
Children between 5–15 years	930
Girls over 15 years	284
Total	1226

The village has its own schools, church, and laundry. It is very difficult accurately to ascertain the number of children protected by a previous attack of scarlet fever. About 750 attend school daily. All attend church on Sunday. All except the younger ones attend an evening service on Wednesday, so that opportunities for transmission of infection, in order of probability, would be: (1) in the cottage, (2) in school, (3) in church, (4) at play, (5) from outside the village, by children going out or visitors coming in.

Frequency of Return Cases.

For the purpose of the present article reference will be made only to group (1) of the preceding paragraph. A return case is defined as scarlet fever occurring within a month in a cottage to which a child recently treated for the disease has returned. No distinction has been made between a month of 30 or 31 days. If there be an error in this reckoning, it is a constant factor over the whole period. Such a return case may not have arisen from the cottage; it may have arisen from one of the other possible foci, or from some focus unknown.

Upon this subject of return cases Dr. F. M. Turner[5] gave as his conclusion: "The alleged return cases include some coincidences as well as true cases, but the proportion of the former is small. Among scarlet fever outbreaks arising after the discharge of scarlet fever cases, the proportion is probably less than 10 per cent." Some authorities adopt a longer period than one month—viz., six weeks up to three months. Any patient who on discharge from hospital infects, or is alleged to have infected, another is referred to as the "infecting case."[6] Both the return case rate and the infecting rate will be given. In those cottages in which are two or more infecting cases, only one will be counted unless an interval of over one month elapsed between the first infecting case and the second return case, the latter then being reckoned as having arisen from the second infecting case.

A tabulation made of the incidence of scarlet fever in the village during 1921 showed an unusually large number of return cases. This suggested the tabulation of all previous outbreaks of the disease for purposes of comparison and to seek a cause for these return cases. The statistics of earlier years are from the infirmary admissions book, which contains a record of admission and discharge dates with diagnosis. In those days the medical officer was not given the amount of assistance which he obtains at the present time, consequently the records are not so full as in recent years. Some patients were treated in their own cottages; details of these cases are not available, which fact may account for a discrepancy in some of my figures compared with those published by Dr. Milne. From 1904 to 1910 patients were treated in three or more cottages used as hospitals, and subsequently in the new hospital, a modern building composed of three wards of 20 beds each and six wards of one bed each.

History of Scarlet Fever in the Village Home, 1902–1923.

The following paragraphs give the history of scarlet fever in the Girls' Village Home from 1902 onwards:—

1902–3.—Three cases each year; all were removed to the Ilford Isolation Hospital. No return case.

1904–5.—From Dec. 16th, 1904, to Nov. 18th, 1905, there were 105 cases. Of these 19 were removed to the Ilford Isolation Hospital; 78 were treated in the Village Home Hospital Cottages; of 8 I can find no record beyond the fact of notification. In reporting this outbreak, the late Dr. Milne wrote: "The most careful separation of the infected children and isolation of those who had been exposed was carried out." This quotation leads one to infer that up to 1905 Dr. Milne had not put into wide use in institutional practice his method, later recommended, of short-period treatment without isolation. These 78 patients were detained in hospital cottages on an average of 52·5 days each. There was only one return case, a rate of 1·2 per cent.

1906–7.—Two and three cases respectively; all removed to the Ilford Isolation Hospital. One return case.

1908–9.—From August 27th, 1908, to Nov. 10th, 1909, there were 31 cases, of which 3 occurred in the receiving house. The first 4 cases were removed to the Ilford Isolation Hospital. Of the 24 remaining cases no record can be traced of 5, which were probably nursed in their own cottages, leaving 19 treated in hospital cottages. Of the latter, one was detained in hospital seven months, one 50 days, one 39 days; the remaining 16 were detained on an average 19 days each. Among the 19 cases can be traced 3 infecting cases causing 5 return cases, giving an infecting rate of 15·7 per cent., and a return case rate of 26·3 per cent.

1910.—Nine cases, two of them in the receiving house; one was nursed in her own cottage, and six in hospital for 32, 28, 19, 75, 22, 191 days respectively. No return case.

1911.—Five cases, detained in hospital for 14, 20, 37, 47, 99 days respectively. No return case.

1912.—One case at the gate house, probably nursed in that house.

1913.—Four cases, three detained in hospital 10, 26, and 142 days respectively. No record of the remaining case. No return case.

1914.—Six cases, three in the receiving house, the other three detained in the hospital on an average 36 days each. No return case.

1915.—Seven cases, all detained in hospital on an average of 30 days each. No return case.

1916.—One case detained in hospital 20 days. No return case.

1917.—Two cases, one in the receiving house, the other detained in hospital 33 days. No return case.

1918.—Seventy-six cases occurred in cottages. They were treated in hospital, not isolated from children suffering from other diseases. The average stay of each in hospital was 12 days. In this year, in 21 different cottages, there were 35 return cases (46 per cent.). Among these, 24 infecting cases can be traced, an infecting rate of 31·5 per cent.

1919.—Ten cases, all detained in hospital on an average of 15·4 days each. One return case (10 per cent.).

1920.—Fifty cases in cottages, detained in hospital on an average of 16 days each. Four return cases occurred (8 per cent.). The infecting rate was also 8 per cent. I cannot say why the return cases were so much fewer in this year than one would have expected. In his text-book on Medicine, Osler[8] has said with reference to scarlet fever: "No one of the acute infections varies so greatly in the intensity of the outbreaks. . . . In some years it is mild, in others, with equally widespread epidemics, it is fearfully malignant."

1921.—In the cottages and among the nursing staff 133 cases occurred, 6 others were admitted from outside homes in Hackney and Stepney, and 19 occurred in the receiving house, making a total of 158 cases. Only the cottage cases will be referred to, as the subject here is return cases from the cottages. These 133 patients were detained in hospital on an average of 19·5 days each. There were in 14 different cottages 35 return cases (26·3 per cent.). There were 21 infecting cases, an infecting rate of 15·7 per cent. From Jan. 1st to March 20th, 1922, there were six return cases out of 24 patients discharged. On March 22nd all scarlet fever patients were isolated in one ward, and kept in for six weeks or longer, until nose and throat were clear of evident disease. The eucalyptus and carbolic oil treatment was used as heretofore. An immediate drop in incidence and return cases took place, only one return case having occurred up to March 21st, which completed one year of isolation treatment.

During the year from April 1st, 1922, to March 31st, 1923, there were 27 village cases, among which are included one nurse and two girls in the hospital where they were treated. There was one cottage return case. To compare with a complete year of the non-isolation treatment, the following statistics are given. During the year April 1st, 1921, to March 31st, 1922, there were 124 patients with scarlet fever, among them 35 return cases, a rate of 28·2 per cent.; there were 23 infecting cases, giving an infecting rate of 18·5 per cent. In the following year, from April 1st, 1922, to March 31st, 1923, by no other change than keeping the patients isolated on an average of 54 days each, the incidence has been reduced immediately to 27 cases with one return case, a drop from 28·2 per cent. to 3·7 per cent. The return case was from a child kept in 40 days. Had she been detained a week or ten days longer the result might have been different; on the other hand, it might not.

It should be stated that on July 11th, 1921, the work was begun of renovating the drains in the village. By April 1st, 1922, 36 cottages had drains completed. During the following year, till March 31st, 1923, there were 16 fresh cases of scarlet fever in these cottages, as against eight cases in those in which the drains had not been finished. These figures would indicate that improvement in drainage had not been a serious factor in leading to the reduction in incidence of the disease.

Comparative Considerations.

So as the more easily to compile tables and make comparisons with other areas, the year of isolation will be dated from April 1st, 1922, to March 31st, 1923. Bearing this fact in mind with regard to the final two lines in Table A—the table contains some of the recorded facts relating to outbreaks of ten cases or over—from it the general truth emerges that, between a period of 10–50 days, the longer the period of detention the fewer the return cases. After a detention of 50 days it might be wise to transfer the patient to a non-infectious ward to avoid his mucous membranes having sown on them a fresh infection by acute patients recently admitted.[9]

TABLE A.

Year.	Total village cases.	Detention in hospital (days).	No. of return cases.	Percentage of return cases.	Infecting rate.
1904–5 ..	78	52·5	1	1·2	1·2
1908–9 ..	19	23·8	5	26·3	15·7
1918 ..	76	12·0	35	46·0	31·5
1919 ..	10	15·4	1	10·0	10·0
1920 ..	50	16·0	4	8·0	8·0
1921–2 ..	124	19·5	35	28·2	18·5
1922–3 ..	27	54·0	1	3·7	3·7

TABLE B.

—	April 1st, 1921, to March 31st, 1922.		April 1st, 1922, to March 31st, 1923.	
	No. of village cases.	% at village home of total cases in Ilford.	No. of village cases.	% at village home of total cases in Ilford.
April ..	13	26	4	22
May.. ..	18	60	4	16
June ..	13	41	4	21
July.. ..	11	36	4	16
August ..	6	31	1	12
September	10	35	3	15
October ..	17	40	1	11
November	3	9	4	28
December	12	24	2	15
January ..	15	34	1	11
February	9	30	2	25
March ..	8	28	*0	—

* In March there were 7 cases in Ilford.

Table B illustrates the drop in incidence in the village home as compared with that in the whole area of the Ilford Urban District Council, which includes the village home. In the year of more prolonged isolation, the village cases were a much smaller percentage of the total cases in the Ilford district than in the previous year. In both years eucalyptus and carbolic oil treatment was applied.

I cannot explain the irregular drop to three in the number of cases in November, 1921. Search for an explanation has been fruitless. The admissions for tonsillitis in October, November, and December, 1921, were 18, 14, 14 respectively.

Table C gives the percentage drop in incidence in the village home in the prolonged isolation year compared with the previous year, and similar figures have been prepared showing the drop in the M.A.B. area. The figure has been obtained thus: in one year were 14 cases, in the next year 4 cases, a drop of 10, which is a 71·4 per cent. decline. The M.A.B. figures show a decline due to the abating of the epidemic. There is a much greater decline in the village home figures, this decline being composed of the additional factor of more prolonged isolation of patients in hospital.

TABLE C.

—	Village cases.			M.A.B. cases.		
	1921–2.	1922–3.	% drop in incidence.	% drop in incidence.	1921–2.	1922–3.
April ..	14	4	71·4	23·2	1739	1335
May ..	18	4	77·7	33·6	2079	1379
June ..	13	4	69·2	44·3	2621	1460
July ..	11	4	63·6	45·9	2352	1272
August ..	7	1	85·7	42·6	1748	1002
September	12	3	75·0	60·6	3920	1544
October..	17	1	94·1	72·2	5718	1586
November	3	4	+	67·5	3645	1184
December	14	2	85·7	61·3	2584	999
January	15	1	93·3	54·5	2527	1148
February	10	2	80·0	49·8	1649	826
March ..	9	0	a	38·7	1320	808

Spread of Infection in Wards.

In spite of the continued use of eucalyptus and carbolic oils, there was a spread of infection to susceptible persons. This is illustrated by the following examples:—

(*a*) *Nurses.*—(1) Nurse A., while nursing in a ward, between March 5th and 11th, 1921, attended six fresh cases of scarlet fever. On the 12th she was ill with the disease. (2) Nurse B., a new probationer, went on duty on Feb. 16th, 1922, in a ward where several patients had scarlet fever. On the 22nd she took the disease. (3) Nurse C. worked in a house where was a child who had scarlet fever on August 12th, 1921, and who was detained in the same house until Oct. 14th, 1921; the nurse took scarlet fever on Sept. 11th. Her duties would lead her into frequent contact with the child. (4) I have notes of four other nurses who have taken scarlet fever under similar circumstances during the past five years. Our nursing staff rarely exceeds 18.

(*b*) *Other Patients.*—(1) A girl aged 8 admitted with tuberculous peritonitis on Feb. 26th, 1921. On March 7th she was very ill with broncho-pneumonia. On the 10th scarlet fever supervened, followed three days later by death, which in my opinion was hastened, not caused, by scarlet fever. In the same ward were patients with scarlet fever being treated by eucalyptus and carbolic oils. (2) Girl aged 12 admitted with follicular tonsillitis on Nov. 29th, 1921; on Dec. 9th up and about the ward; on the 12th scarlet fever. In the same ward were six other children being treated for scarlet fever. (3) Girl aged 13 admitted with tonsillitis on Jan. 24th, 1921. On Feb. 4th up and about the ward; on the 9th scarlet fever. In the same ward was a case being treated for scarlet fever.

I have notes of other very similar cases illustrating this point. It must be understood that all these patients were being treated with eucalyptus and carbolic oils from the first suspicion of scarlet fever—that is, on the onset of sore throat. Some of these cross-infections may be coincidences, some may possibly be from outside sources, but it is surely against common sense and the laws of evidence to accept a bare possibility on the one side against a strong probability on the other.

Complications.

The use of eucalyptus oil and carbolic oil did not prevent the onset of secondary complications. Table D gives those in the village homes among 62 patients in 1922, and for comparison those occurring in the Ilford Isolation Hospital under the care of the medical officer of health, Dr. A. H. G. Burton, who has kindly given me his statistics :—

Table D.

Complications of Scarlet Fever in 1922.

—	Percentage of Village Home cases.	Percentage of Ilford Isolation Hospital cases.
Albuminuria	6·4	9·8
Adenitis	19·3	24·6
Broncho-pneumonia and death	1·6	nil
Endocarditis	nil	nil
Jaundice	nil	1·2
Otitis media	4·8	8·02
Rheumatism	nil	4·9
Rhinitis	4·8	nil or not stated.

Remarks.

The criticism will be raised that the treatment has not been carried out in the proper manner. In reply it should be pointed out that the matrons in charge of institutions in which I observed the treatment to fail had been there for several years under the late chief medical officer, Dr. Milne, and are still in charge of their nursing staffs. They agree that the application of the method had not changed in any way since the retirement of Dr. Milne towards the end of 1919; but in fairness to them it must be recorded that they retained their belief in the treatment while my faith failed. It was suggested that the eucalyptus oil was inferior to that used in previous years; a specimen was sent to the Clinical Research Association, Ltd., for examination, and the following report was returned: "March 14th, 1922, No. 8987. This is a specimen of genuine eucalyptus oil of very good quality. It conforms to all the British Pharmacopœia tests and contains 77 per cent. of cineol."

If the figures given of the period of detention in hospital of cases from 1910 to 1917 be examined, it will be found that they are not, on the whole, short; further, these cases are too few for any valid conclusion to be drawn from them. A striking fact is seen on examining the years 1904–5 and 1922–3 as set forth in Table A.; both periods have one return case, and a prolonged detention in hospital; the intervening years have a shorter period of detention, and many return cases.

It is generally accepted that in scarlet fever the desquamation of the skin is not infectious, but that the discharges from mucous surfaces are infectious, especially during the more acute stages of the disease. In a convalescent patient any discharges from the ear, nose, or throat, are to be regarded as infectious; and a patient should not be allowed to mingle with healthy children until these parts show no sign of active disease.

It would be sound treatment if all discharging ears, which did not clear up in eight to ten weeks after the throat, nose, and naso-pharynx had been treated were subjected to an incomplete mastoidectomy along the lines of the Heath operation. This would conserve the hearing, and remove a focus of disease in a potential carrier. Convalescent patients from scarlet fever who have hypertrophy of the tonsils which show signs of disease should have the tonsils enucleated. If the tonsils be atrophic but diseased they should be removed. Some of the indications for the removal of tonsils and adenoids after scarlet fever are mouth-breathing, rhinorrhœa, otorrhœa, an unhealthy angry-looking surface of a diffluent tonsil, and enlargement of cervical glands after rheumatism complicating the disease. The application of carbolic oil by swabbing to the throat is, in my opinion, of doubtful value, and may be harmful. The tonsils and fauces are acutely inflamed; to swab such an area not infrequently causes an abrasion of mucous membrane with slight bleeding, especially in young and nervous children, thus opening up fresh paths for the entry of pathogenic organisms. I am quite aware that carbolic oil has a local analgesic action which is sometimes appreciated, but I am not sure that the patient would not be more benefited by a hot inhalation of tinct. benz. co. or carbolic acid, by the use of which no trauma would be caused, but which would act as a hot fomentation to the inflamed throat. In a severe case of scarlet fever the infection invades, not only the tonsils and pharynx, but probably the nasal cavities and accessory sinuses, Eustachian tube, larynx, and trachea; hence the futility of seeking to apply any antiseptic to the infected area, beyond the cleansing of the mouth which is routine in all cases of fever.

Conclusions.

1. The use of eucalyptus oil applied to the skin, and of carbolic oil to the throat in the treatment of scarlet fever (*a*) does not prevent the occurrence of return cases, (*b*) does not prevent the infection spreading to susceptible patients and attendants during the course of treatment, (*c*) does not prevent secondary complications.

2. The number of return cases varies inversely as the length of the period of detention, when this period is up to about eight weeks.

3. All cases of scarlet fever should be isolated for at least eight weeks. They should not be allowed to mingle with other children until the ear, nose, and throat appeared healthy.

I wish to express very cordial thanks to Dr. A. H. G. Burton, the medical officer of health for Ilford, for assistance in obtaining statistics used in some of the tables, and for very willingly supplying information on many points discussed in this paper.

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GASTRO-DUODENOSTOMY *V.* GASTRO-ENTEROSTOMY IN THE TREATMENT OF CHRONIC DUODENAL ULCER.

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In spite of all that has been written about the medical treatment of duodenal ulcer, there can be no doubt that surgery is the safest and the most expeditious remedy for this disease as we see it at the present day. Possibly earlier recognition of the condition and of the primary infecting focus will render surgical treatment of the ulcer unnecessary. At present medical treatment is more dangerous than surgical. Acute perforation and hæmorrhage only occur after one course and usually after many courses of medical treatment; a surgeon may be called in to deal with these emergencies and the patient may succumb, but the death must be placed to the account of medicine, for surgical treatment before the catastrophe would almost certainly have prevented it, and the death-rate after gastro-enterostomy in the chronic stage of the disease is negligible.

When we consider the progress of a patient after surgical treatment we find that most surgeons state that they cure between 80 and 90 per cent. of their patients, and undoubtedly gastro-enterostomy, accompanied by local treatment of the ulcer and eradication of a supposed primary infecting focus, is a highly satisfactory operation. Whether it is true that so high a percentage of cures is effected is perhaps an open question, and depends on the definition of cure. Indiscretions in diet or habits, in a fair proportion of these cases, are apt to cause temporary discomfort in the form of flatulence and a feeling of uncomfortable distention, which may be quickly recovered from, but serves to show that the reserve territory, as it were, between health and disease has been considerably reduced, and that though the ulcer has been cured in that there are no recurrences of ulcer attacks, the remedy has exposed the patient to inconveniences to which a normal person is not liable.

The progress after medical treatment is almost invariably a recurrence of the ulcer attacks; there is remission of varying duration, but not cure in any sense. Medical treatment has to be so prolonged, and is so irksome, that the patients will not be bothered with it once the attacks have thoroughly subsided. However, it is my intention not to contrast medical and surgical treatment further, but rather to criticise surgical opinion in its relation to duodenal ulcer—that is to say, whether it is right to regard gastro-enterostomy as *the* operation to perform.

Gastro-duodenostomy: Trial Advocated.

We have become so accustomed to treating chronic duodenal ulcer by this operation that the mention of the one almost automatically calls up in one's mind a vision of the other. In the earlier days of the treatment of this disease gastro-enterostomy had many rivals, but it gradually ousted them all, as the results achieved were found to be so much superior to those attained by any other method which received an adequate trial. There is one operation, however, which I think has never had such a trial, and which in the opinion of a few surgeons still holds its ground as a successful rival to gastro-enterostomy, but only under exceptional circumstances. I refer to gastro-duodenostomy. The present-day surgical opinion may be briefly stated as follows. With a favourable disposition of the parts gastro-duodenostomy may be performed, and the results will be as good as those after gastro-enterostomy; but gastro-enterostomy will have to be done in the vast majority of cases, because the duodenum cannot be sufficiently mobilised. The operation, therefore, is only performed in some 4 or 5 per cent. of cases at the most. Since 1894, when Jaboulay first did gastro-duodenostomy, this has been, generally speaking, the recognised surgical opinion, though no one, so far as I know, has done the operation in a consecutive series of cases.

Technique.

Surgical text-books give the scantiest attention to this operation, when they mention it at all. Probably anatomists are partly responsible, because they have always taught that the duodenum is a fixed organ ike the ascending colon, whereas both organs have a considerable degree of mobility; the ascending colon practically always, and the second part of the duodenum not infrequently, has a definite mesentery. I venture to say that after dividing the peritoneum on the posterior abdominal wall to the outer side of the duodenum very little further manipulation will suffice to bring the duodenum to the surface of the usual abdominal wound used for stomach operations, not only where the duodenum is normal, but even when a duodenal ulcer is present. That this is no exaggeration is shown by the fact that in the last 53 cases of duodenal ulcer I have been able to perform gastro-duodenostomy in 50, and had to employ gastro-enterostomy only three times—twice because of dense pathological adhesions, and in the other case (a boy aged 12) because there was such a large inflammatory mass around the ulcer that I thought it wiser to leave the neighbourhood alone. I may come across a long series in which it will be inadvisable to do gastro-duodenostomy, but those cases on which I have already done it have been the type of duodenal ulcer usually met with. I think this operation will be possible in some 90 per cent. or more of cases, and that consequently gastro-enterostomy will only need to be performed in less than 10 per cent.

After mobilising the duodenum in the manner already indicated, and after dealing with the ulcer by cautery or otherwise, an anastomosis is made between the second part of the duodenum and the anterior surface of the stomach close to the pylorus; the suturing is done exactly as in gastro-enterostomy. The raw area left on the posterior abdominal wall can easily be covered by peritoneum or omentum.

The only impediment to the more frequent employment of this operation is the supposed difficulty in mobilising the duodenum, for if one asks a surgeon whether he performs this operation he answers that he does in suitable cases, implying that he regards it as equal in efficiency to gastro-enterostomy when it can be done. I maintain that it can be performed in nearly every instance, and with no more risk to the patient than that attached to gastro-enterostomy. If I am right in this, I think there are material advantages to be derived from employing it more frequently.

It is rather difficult to compare the results after gastro-duodenostomy with those after gastro-enterostomy; the latter operation has been performed so infinitely more often that it is only natural that one should see more cases requiring further treatment than after the former. Many surgeons have done gastro-duodenostomy on rare occasions, and in the aggregate this means quite a large number have been performed, yet I have never heard of a surgeon regretting that he did the operation, and I have never seen a case return for further treatment of any sort. It is quite true that gastro-enterostomy gives very good results, but no surgeon who sees many stomach cases can say that he has not had many, either of his own or someone else's, return to him incompletely cured, sometimes, indeed, worse than before. No case has been reported of the occurrence of an ulcer at the line of the anastomosis after gastro-duodenostomy; this complication occurs in at least 2 per cent. of cases after gastro-enterostomy. The patient is then in a much worse state than before the original operation, for this disease is more crippling, and a very formidable operation is necessary to cure it.

It is so unlikely that an ulcer will ever be seen at the anastomotic line after gastro-duodenostomy that when I have a gastro-jejunal or jejunal ulcer to deal with I excise it, suture the openings in the stomach and jejunum, and do gastro-duodenostomy. I believe this will become the usual treatment, until the performing of gastro-duodenostomy in the first instance renders an operation for these anastomotic ulcers unnecessary. Hitherto, gastro-duodenal ulcers have been treated by excision and a new gastro-enterostomy, or better by partial gastrectomy; neither of these can be relied upon to prevent another ulcer of the same kind returning, for I have seen one certain case, and I think a second, in which a gastro-jejunal ulcer appeared after partial gastrectomy.

Other Considerations.

Two further considerations may be of importance. In performing gastro-duodenostomy one does not interfere with the small intestine below the great omentum, whereas, of course, in gastro-enterostomy one does, and it is usual to find adhesions of some coils of the small intestine to the neighbourhood of the anastomosis, which, at any rate, cannot be a desirable state of affairs. The other point is, that wherever a new opening is made it will produce some tethering of the stomach, and it would seem to me better that this should occur at a point normally somewhat fixed as the pylorus is, rather than on the freely moving posterior surface of the stomach.

From a physiological point of view gastro-duodenostomy should be the better operation, as it is a much nearer approach to Nature's plan. It may be said that a gastro-enterostomy opening being at the lowest point of the stomach will drain this organ more effectively, but the stomach of a patient with a duodenal ulcer is either a shallow high-lying one, or a big hypertrophied organ with powerful muscular contractions. It is only reasonable to suppose that Nature, having placed the pylorus at the most favourable point, will continue to utilise an opening as near the normal one as possible to better advantage than one at some distance away, as is the gastro-enterostomy opening.

It is still early to speak of the results in my series, as these cases refer to a period of only a year, but up to the present the post-operative progress of the patients has been most satisfactory—certainly as good as, and I think better than, after gastro-enterostomy. The question of mortality need not be brought into the discussion; there have been no deaths in my series, and, of course, there is practically no death-rate for gastro-enterostomy; it is less than 1 per cent.

I believe gastro-duodenostomy to be both more natural and physiological (if one may use the term in connexion with any short-circuiting operation) than gastro-enterostomy, and I believe it will be found possible to perform it in all but a very small percentage of cases. It should be remembered, too, that in a small percentage of cases it is also impossible to do posterior gastro-enterostomy, either because of a very small stomach in a fat patient, or because the lesser sac, or that part of it which is required for the operation, is obliterated by adhesions. Anterior gastro-enterostomy is then usually done, and this is not a desirable operation.

Clinical and Laboratory Notes.

A CASE OF ACUTE MYELITIS, WITH RECOVERY.

By F. Joselin Jauch, M.R.C.S. Eng.,
LATE RESIDENT MEDICAL OFFICER, LONDON TEMPERANCE HOSPITAL.

It is well known that complete or even partial recovery from acute myelitis is rare, death usually occurring from ascending urinary infection, trophic disturbances, or pulmonary complications. The following case is perhaps unique, in that the patient, who showed all the signs and symptoms associated with that condition, suffers after nine months from no serious effects, with the exception of some difficulty in retaining his urine.

History.—A male, aged 47, engaged in secretarial work, was seized on Oct. 25th, 1922, with very severe pain in the scapular region at about 7.30 P.M., followed two hours afterwards by severe pains in both feet. He went to bed shortly afterwards. On waking up in the morning the pains in the back were less, his feet still ached, and he had lost sensation and power of movement of his lower limbs. His bowels were confined and in the evening he observed incontinence of urine. He had been in the Navy 8½ years; there was no history of syphilis. He had had gonorrhœa at 17 years of age and "Malta flux" at 30, otherwise he had had no serious complaints. He was married and had a healthy child of 5; his wife was apparently healthy and there had been no miscarriages. He was sent to the London Temperance Hospital on the 30th, four days after the onset of the condition, with a diagnosis of acute intestinal obstruction.

Condition on Admission.—Pulse 120, respiration 30, temperature 96·6° F. Patient of good physique, tongue thickly coated; abdomen distended, with some rigidity, especially in upper half; retention of urine with overflow, and complete confinement of bowels. Nervous system showed the changes usually associated with complete transverse myelitis; complete anæsthesia to heat and touch from the xiphisternum downwards; above this area, which extended upwards and backwards to the outer edge of the erector spinæ, there was an ill-defined band of hyperæsthesia. On the right-hand side the anæsthetic area reached up to the umbilicus only. Paralysis of the lower limbs and lower abdominal wall was complete; no control over the rectal and urinary sphincters. Knee-jerks, Achilles-jerks, plantar and abdominal reflexes were absent. Right pupil showed some irregularity in outline, but both sides reacted normally. Trophic changes were evidenced by presence of pressure ulcers in lower dorsal and sacral regions, as well as over both heels. Repeated examination of the cerebrospinal fluid, which on the first occasion flowed at a slightly increased pressure, showed no macroscopic, cytological, or chemical changes; it was sterile, and the Wassermann and blood reactions were repeatedly negative. The other systems appeared normal.

Course of Case.—Sensation gradually returned, and on Nov. 3rd the hyperæsthetic area had disappeared, superficial and proprioceptive sensation had been re-established, though deep pressure was painful. Some spasticity of the lower limbs was present. On the 10th very slight effusion into the knee-joints occurred, also, later, some periarticular swelling of the right metacarpo-phalangeal joint; these conditions, however, subsided entirely. At this time a very small degree of abduction and adduction at the hip became possible, as well as flexion and extension at the knee and ankle. The knee-jerks and abdominal reflexes were just obtainable. Improvement was maintained, and on Jan. 3rd, 1923, the patient got up and was able to stand on his legs. Some control over the rectum had been established, and the patient managed to retain his urine for one to two hours.

Partial Recovery.—The patient was discharged on March 7th. Sensation was normal; walking was possible with the aid of a stick; the gait was shuffling in character; there was some difficulty in turning about. The knee-jerks were slightly exaggerated; the plantar reflexes were of the extensor type. No Rombergism or ataxia was present. Control over the rectum was almost complete. As regards micturition, the patient had about two minutes' warning, after which the bladder emptied reflexly; it was necessary, therefore, to wear a urinal. He is now able to stand seven to eight hours a day, and can walk six to seven miles quite comfortably. Occasionally he has some cramp in his feet; the urinary mechanism has improved, and there has been a gain in weight to the extent of 22 lbs. Treatment was symptomatic; massage and faradism were commenced very early.

For permission to publish this case I am indebted to Dr. Porter Parkinson, senior physician to the hospital.

AN UNUSUAL CASE OF CHICKEN-POX.

By H. Cooper Pattin, M.D., D.P.H. Camb.,
MEDICAL OFFICER OF HEALTH, CITY OF NORWICH.

On a certain Monday my assistant, Dr. G. L. Leggat, was taking a school clinic, and experienced a shock when a woman brought into the room a girl, aged 11, with what, at first sight, looked like small-pox. After careful investigation of the rash, which in distribution was certainly that of small-pox rather than of chicken-pox, noting that it was at varying stages, that the girl had four good vaccination marks, that she appeared to be quite well, and learning that she had never been ill, Dr. Leggat diagnosed the case as one of chicken-pox and referred the case to me. Looking at the distribution of the eruption, my first impression was that it was small-pox; but going carefully over the character of the rash and the history, I concurred with Dr. Leggat's diagnosis and agreed that it was one of chicken-pox; albeit the most unusual case I had seen. Whilst there was a generalised distribution of rash it was most abundant on the face, forearms, hands, legs, and feet, some on plantar surface of the latter; it appeared on the flexor as well as extensor surfaces, and was, in places, almost confluent.

The history was this. The girl had been to a school treat on the preceding Thursday, which was a very hot day with a broiling sun, and her face, arms, hands, legs, and feet had been freely exposed to the sun, as also had the back of her neck and interscapular area, where the eruption also was dense. She came home tired, but quite well, and developed some vesicles during the night; at any rate these were very noticeable in the morning; the mother called in no doctor, and in fact only brought her up to the school clinic on the following Monday because she had become alarmed at the further and more profuse development of the eruption; when seen by us many of these vesicles had become pustular and a few had maturated and become encrusted. The girl was never ill at any time.

The explanation we arrived at respecting the unusual distribution of the eruption was that the sun's heat had given rise to some heat erythema of the exposed parts, and that this accidental superficial irritation had determined the profuse character of the subsequent eruption; and this belief has been fortified by a few other cases, but none of so striking a character. Subsequently our diagnosis received confirmation by the occurrence of chicken-pox in a sister 17 days after the appearance of the eruption in the first instance. In Dr. McC. Wanklyn's book on "How to Diagnose Small-pox," on pp. 58–59 there is recorded a strikingly similar case. The point is worth considering when chicken-pox erupts in hot sunny weather.

THREE CASES OF SCURVY.

By ROBERT H. NORGATE, M.R.C.S. ENG.,
MEDICAL SUPERINTENDENT, SOUTHMEAD INFIRMARY, BRISTOL.

DURING the past two years there have been three cases of scurvy under treatment in the Southmead Infirmary, Bristol. Such cases are unusual now that conditions of life are more normal.

CASE 1.—Female, aged 28, admitted Nov. 23rd, 1922, from a Poor-law institution, where there is always an abundance of green vegetables in the diet; the patient, however, always refused to take vegetables and took an excess of salt with her food. Temp. 98·6° F., pulse 94, resp. 16. Spongy gums, teeth buried in them; hæmorrhages in legs and follicular keratosis on both arms and legs; skin very dry, with a stained appearance; patient thin and haggard. Some fœtor of the breath; no hæmorrhage in urine or stools; no albumin. Green vegetables were insisted upon at each meal and oranges were given. She made a rapid recovery.

CASE 2.—Male, aged 52, a labourer, sent in on April 20th, 1923, as a case of iliac thrombosis complicating tabes dorsalis; no abdominal pain; right leg very red, with swollen spots; hæmorrhages in the tissues, several purpuric blotches on both legs, and follicular keratosis. Typical signs of tabes; no hæmorrhage in stools or urine; both iliac arteries and right popliteal artery pulsating; history of leg swelling now and again, and this time four days. Patient was kept in bed at rest and plenty of green vegetables and oranges given daily, and salt decreased. Patient has only one tooth, but the gums are very red and spongy and bleed easily. He was able to get up in a month and was discharged on June 2nd, all swelling and signs of hæmorrhage having disappeared. He had been living on tinned foods, with no vegetables; he had been out of work for a considerable time, owing to tabes, and was unable to walk far.

CASE 3.—Male, aged 58, a clerk, had seen better days but ad recently been out of work. Sent in as a case of heumatism on June 2nd, 1923; seen by assistant medical officer and diagnosed as "iliac thrombosis." For two weeks he right leg had been swollen and there had been purpuric æmorrhages like hæmatomata in muscles of the calf; keratosis on both arms and legs; popliteal vessel pulsating; gums so swollen as to almost hide the teeth, and bleeding easily. Patient had been living in common lodging-houses, eating salt meat and tinned foods with no vegetables, having no facilities for cooking the latter. Lettuce or other greenstuff is very scarce and expensive this year, and not being a tramp patient had not had opportunity of getting t. The case ran the ordinary course. All hæmorrhages ave now disappeared, and he is now well.

On discharge each case was warned as to diet and he necessity of green food.

POST-GRADUATE TEACHING IN LIVERPOOL.—A ourse of clinics under the auspices of the Board of Clinical Studies is being inaugurated for the coming winter. The nderlying idea is to provide each day of the week at .30 P.M. a demonstration of clinical material of interest to he general practitioner. The work is being undertaken by he honorary staffs of the hospitals, both general and special, nd all the hospitals of the city are taking part. Advantage ay be taken of as many or as few of the meetings as may e found practical by local doctors, and the favourable eception given to the preliminary notices suggests that the ffort of the Clinical Board is meeting a real want. The linics will be free.

BRITISH MEDICAL ASSOCIATION.

ANNUAL MEETING AT PORTSMOUTH.

(*Continued from p. 463.*)

SECTION OF TUBERCULOSIS.

WEDNESDAY, JULY 25TH.

AT the opening session of this section Sir HENRY GAUVAIN (Alton), the President, being in the chair, Prof. AXEL REYN (Med. Supt., Finsen's Medicinske Lysinstitut, Copenhagen) read a paper on the

Artificial Light Treatment

of lupus and other forms of tuberculosis. This treatment, he said, is used in two forms, either in concentrated form as a local application or in non-concentrated form as a light bath. Finsen used the carbon-arc light as the nearest approximation to sunlight, particularly because it contains more ultra-violet rays than the sun, these rays having the strongest effect. The sun-bath treatment, so successfully applied by Bernhard and Rollier, is, because of natural conditions, difficult of application in northern countries and must therefore be replaced by artificial means. The lamps used require to be specially constructed. That for local treatment is a 50-ampère lamp with convergent lenses of rock-crystal for concentration, the heating rays being absorbed by distilled water interposed between some of the lenses. For the light bath 50 to 52 volts are the most advantageous, working with 70 volts on the conducted current, the surplus being necessary for quiet and steady functioning. Glass as an envelope is not used. Where a number of patients require to be treated at the same time 75-ampère lamps are used, the intensity of the light decreasing, of course, with the square of the distance. As to the class of case so treated:—

1. Lupus vulgaris and other forms of skin tuberculosis. In this class the value of the local light treatment is incontestable, and in those patients refractory to it a combined local treatment and the light bath have produced something like 90 per cent. of cures.

2. Surgical tuberculosis. In these cases sinuses, abscesses, &c., the results of treatment have been excellent, more especially when regard is had to the fact that the majority were adults with poor and unhealthy homes, treated as out-patients and chronics. In a large number it is noteworthy that cure has been accompanied by the regaining of free mobility of the joints. The results indeed are as good as those obtained by heliotherapy in mountain heights.

As one would expect, a shorter period of treatment suffices for children than for adults, for affections of the small joints than for those of the large, and for disease of the soft tissues and bones. Tuberculous glands form a special category in which brilliant results have followed treatment by a combination of carbon-arc light, X rays, and light baths alone. It is to be understood, of course, that necessary operative measures for the correction of deformities and ankylosis are indispensable. The good results from treatment are due to the chemical power exercised by the rays of light which produce erythema of the skin, pigmentation, and stimulation of the organism generally, and various investigators have shown that the greatest effect is produced by ultra-violet long-wave rays. The carbon-arc light contains all the rays of the spectrum, whereas the mercury-vapour lamp emits mainly the short-wave ultra-violet rays with little power of penetration. The latter is therefore less suitable for use. The best results are only to be obtained if a pronounced erythema is produced in the earliest stages of the treatment, contrary to Rollier's opinion. As it is essential to employ the relatively deep penetration of the carbon-arc rays the tissues subjected to the process must be made bloodless by compression. Methods of treatment which aim only at producing a superficial effect, as in cases of extensive lupus, will fail.

Prof. Reyn showed several charts and tables and related illustrative examples of the treatment outlined above.

Dr. J. H. **SEQUEIRA** (London) stated that many of those who began to employ the Finsen-light treatment when there was a boom in such methods failed to achieve good results because of lack of technique. Treatment by the concentrated arc light is expensive, and by employing the arc bath the duration of exposure is shortened and the expense is less. Exposure of the whole body also renders the local action more effective. Both local and general treatment should be the method of attack, in which excision, the use of salicylic acid, creasote, and so on, may be helpful in given cases. From an æsthetic point of view the value of the light treatment is considerable. In dry lupus it is the ideal method of treatment and in ulcerative conditions may be of great service. Having employed the treatment for over 23 years he could testify to the permanence of the cures obtained by its aid. The cases contrast with the effects of treating tuberculosis by the indiscriminate use of the X rays—e.g., in lupus, in which ten years after carcinoma may follow, produced solely by the rays. Nevertheless, X rays do produce good effects with occasional short exposures in ulcerative cases. The Finsen-light treatment, besides the local benefit it produces, also improves the general health of the patient, who becomes noticeably bright and alert. Complicating lesions in other parts of the body also heal up, although they have not been locally treated at all. Lastly, the treatment is cheap and costs but 10*d.* per hour to run.

Prof. **SIDNEY RUSS** (London) discussed the wavelengths of the portions of the light spectrum which could be employed, and it was now possible to assign specific reactions to their appropriate wave-lengths. Between 3000 and 2000 (Angström units) waves are readily absorbed by animal tissues, and have a germicidal action, as has been shown by exposing agar plates to the ultra-violet radiation from the tungsten arc. The germicidal action is maintained until a certain wave-length is reached, after which the action is not produced. There is no radiation produced between wave-lengths of 2000 and 3000. They cannot penetrate as much as a millimetre of skin. Between 3000 and 3800 absorption ceases very abruptly, and it is to this region that we must go for effective radiation. Thus full radiation of the sunlight or artificial light is beneficial; if filtered to a wavelength a little less than 3000 benefit is still produced; filtered to get still shorter wave-lengths has no beneficial effect. Those who pigment react favourably to light treatment, which is a necessary part of the treatment. If different artificial sources of light are taken their characteristics differ considerably—e.g., mercury, carbon, &c.—the skin reaction, therefore, depending on the source of the light and the wavelength. It is essential that these characteristics should be ascertained when the results, from an economic point of view, will be justified.

Sir **STCLAIR THOMSON** (London) was impressed by the fact that when he visited Copenhagen it was claimed that 50 per cent. of cases of tuberculous laryngitis were arrested by the light treatment, as he himself by all other methods had only 25 per cent. of arrests. Thus of 500 cases of tuberculous laryngitis treated at Midhurst during the last ten years, 75 per cent. are dead, most of them from general infection. Without doubt, therefore, if the light treatment can produce arrest in 50 per cent. of these cases, and tuberculous laryngitis is the most serious of all complications of the disease, a great step forward will have been taken.

Dr. J. M. **JOHNSTON** (Tor-na-Dee) had used the carbon-arc lamp in two severe cases of tuberculous laryngitis, in one of whom the severe pain was relieved though the disease was advanced. In the other, after six weeks the patient was practically free from pain and all local treatment was stopped. In the treatment of sinuses the results have been remarkably good when all other forms of treatment had failed. He considered that the method, limited though his experience had been, has a definite sphere of usefulness.

Prof. **REYN**, in replying to the discussion, stated his opinion that the Finsen light installation at the London Hospital was the best that he had seen in any country. Two points were insisted upon—technique and general measures in treatment.

The **PRESIDENT**, conveying a vote of thanks to Prof. Reyn, remarked that though light therapy had proved itself of great value in tuberculosis and other diseases the final answer to the whole problem is a clinical one. It is not enough to study the source of the light used in treatment, the patient himself and his individual reactions must also be taken into account.

Dr. J. **GRAVESEN** (Med. Supt., Vejlefjord Sanatorium, Denmark) then read a paper on the present position of the

Surgical Treatment of Pulmonary Tuberculosis.

Modern developments, he said, of surgical treatment applied to cases of pulmonary tuberculosis have followed the practice of artificial pneumothorax. It is a serious drawback to the latter that it and subsequent methods are being used only in advanced cases and are so dependent on a most scrupulous technique, and results must be judged according to the anatomical and physiological possibility of deriving full benefit from the treatment. It becomes necessary to classify the cases with regard to the influence exerted by the presence of pleural adhesions. Tables shown made manifest how frequently adhesions handicap the full benefit of artificial pneumothorax. Classified, the cases fall into the following groups: (1) Cases with complete pneumothorax: (*a*) without adhesions, (*b*) with localised, extended adhesions; (2) cases with incomplete pneumothorax with larger adhesions; (3) cases with universal adhesions—no pneumothorax practicable.

1. Cases with complete pneumothorax without noteworthy adhesions generally prove successful with marked improvement in symptoms, &c., and, in the absence of complications, no further operation is done. Treatment is individual and the optimum pressure and length of interval between insufflations settled according to the clinical indications. In complications, particularly pleuritic effusions, special care is taken so as not to influence the result of treatment. As to the relationship between pneumothorax and ordinary pleurisy with effusions it is found that the addition of insufflation to ordinary aspiration has checked the development of adhesions and allowed the performance of a pneumothorax successfully.

2. Cases with complete or almost complete pneumothorax, but with localised, extended adhesions—thoracoscopy with cauterisation. The only method to be recommended for endopleural operation and the removal of adhesions is that of Jacobaeus, a method of both diagnostic and therapeutic importance. The thoracoscopic method of Jacobaeus enables one to obtain a direct localisation of adhesions, connecting or supplementing that obtained by the X rays. By cauterisation with a platinum wire introduced through a separate cannula adhesions have been destroyed and successful pneumothorax induced. It is a procedure of permanent value in a limited number of pneumothorax cases with string-like or membrane-like adhesions. The cauterisation of surface adhesions may involve the risk of hæmorrhage and the opening of tuberculous foci and cavities with a consequent infection of the pleura, the most serious complication hitherto encountered. Only a weak, redly-glowing galvano-cautery is used. To sum up the results of the author's experience—none of the technical or clinical complications is of such grave importance as to warrant abandoning the method in suitable cases.

3. Artificial pneumothorax not possible to any satisfactory degree—thoracoplasty. The indication for the performance of this method arises when, in cases fit for lung collapse treatment, careful attempts at artificial pneumothorax have failed. Owing to the greater risks involved, however, a more pressing

need of collapse and a more reliable condition of the diseased lung are demanded. Before doing the operation we have to consider (1) whether a partial or a complete thoracoplasty should be done; (2) or the operation done in one, two, or more stages. (1) Partial thoracoplasty may be considered sufficient, either when the affection—e.g., a cavity—is localised to a limited area of the lung, or when a partial pneumothorax has been so established as to provide collapse for the upper or, more frequently, the lower part of the lung. It is unsafe to allow the lower part of the lung to remain expanded owing to the dangers following a post-operative aspiration of sputum into the moving lower lobe. In cases of universal affection of the lung a partial and ineffective pneumothorax should be discontinued in favour of a complete thoracoplasty, modified, of course, according to the extent and special localisation of the disease, a slight affection of one lobe indicating a relatively slight resection of the ribs, large cavities, and more serious disease indicating a more radical resection. (2) The performance of the operation in one or more stages will depend on the individual indications afforded by the patient himself, whether or not he is muscular or lean and healthy, or whether or not he appears to be able to tolerate the completion of the operation in one stage. In cases of doubt we consider the two stage operation to be less risky. The technique followed is that recently described by the author in *Tubercle* (1921, ii., No. 9) except that smaller doses of the local anæsthetic, novocaine-adrenalin, are now used followed by a light ether anæsthesia, sufficient to neutralise the pain, but not to abolish the cough reflex. The results in 105 cases have shown that though a greater risk and a smaller result are to be expected from thoracoplasty than from a successful artificial pneumothorax, the former operation results in a great improvement in the prognosis in such cases as are deprived of the effect of the pneumothorax treatment.

4. Cases of insufficient collapse with simple thoracoplasty. It is still to be considered that the fullest possible resection of the ribs through the posterior incision (Sauerbruch's "hook incision") may fail so that the author has now added in these cases resection of the anterior ends of the upper ribs (except the first owing to its inaccessibility), done either at the second stage of the posterior operation or as a separate third stage, and in extreme cases performing an extrapleural apicolysis through the anterior incision, the cavity being plugged with gauze and allowed to heal gradually by granulation and retraction, or with fat, as, in one instance, transplanted from the patient's abdomen. But cases necessitating this procedure are very rare indeed, nor is there such a large field of indication for it as for thoracoplastic resections.

After Dr. Gravesen had read his paper he showed one of his patients, now his most valued nurse in the sanatorium. She was considered to be in a hopeless condition in 1919, but an operation, as described in his paper, was performed in September, 1921, with an excellent result, as the audience were able to see for themselves.

The PRESIDENT considered the two methods of treatment were a great advance, and as a result one could now replace Dante's familiar lines, "All Hope abandon ye who enter here," by "Revive Hope ye who enter here," so far as the treatment of those severe and advanced conditions were concerned.

Mr. J. E. H. ROBERTS (London) did not think it right to assume always that the presence of adhesions is the cause of the bad result obtained by operation. It is quite possible that the results are bad because the type of infection is bad, and that no surgical procedure, under the circumstances, might be successful. One must consider, having regard to the indications for operation, the good-class patients who are able to undergo the prolonged treatment and the poor patients, especially those who afterwards have to return to manual labour. Though adhesions of the "band" type can be divided safely, most types of adhesions cannot be so treated without grave risk. He considered, therefore, that a thoracoplasty must replace the other procedure, though the operation, in his opinion, is still in the experimental stage, and the technique has not been finally established. The class of case chosen for operation, too, is usually the worst, and the results may improve if patients are operated on in an earlier stage. He disliked ether in thoracic cases. Gas and oxygen have all the advantages of the general anæsthetic and none of the disadvantages. The injection of alcohol into the intercostal nerves, when they are reached, reduces shock, paralyses the intercostal muscles, and puts the side affected at rest. After-treatment is of the utmost importance. Mechanical causes may produce afterwards a great, and sometimes serious, increase of the bronchial secretion, when atropine may be of great service. Any tendency to post-operative scoliosis can be prevented by suitable exercises.

Dr. S. VERE PEARSON (Mundesley) emphasised the necessity for these methods of treatment being carried out in a sanatorium, removing the patient from home conditions. It would not be wise to withhold operation because one thinks that adhesions have formed or are going to form, and one should attend to the indications yielded by ordinary physical examination rather than to those yielded by the X rays. He considered that in many cases too long an interval was allowed to elapse between failure to induce an artificial pneumothorax and the performance of a thoracoplasty. Only those having special experience should do the operation. It is not only a capable carpenter who is wanted, but also a capable physician. Nor is an ordinary surgical nursing home suitable for such cases, for the staff lack the necessary experience.

Dr. L. T. BURRELL (London) thought that unilateral cases of disease are more suitable for operative measures, and earlier thoracoplasty might prevent unilateral disease from becoming bilateral. The essential principle is absolute rest before and after treatment. Thoracoplasty is a great advance in treatment, but one should avoid using the word "cure."

Dr. CLAUDE LILLINGSTON (Gorleston-on-Sea) wondered why a small country like Denmark should be so far ahead of us in this matter of the surgical treatment of tuberculosis of the lungs.

Mr. R. TUDOR EDWARDS (London) had done six cases of thoracoplasty, using local anæsthesia under which no real evidence of shock had been observed. He agreed that cases were not got early enough for operation, and, further, in advanced stages of the disease the heart is poisoned and cannot stand the pushing over of the mediastinum which is a necessary part of this operative procedure.

Dr. GRAVESEN, in reply, emphasised the necessity of the expert being expert in everything; the surgeon should also be physician, and the patient should be operated on in the sanatorium where he is under supervision. Answering certain questions and observations arising during the discussion, Dr. Gravesen stated that small effusions in cases of pleurisy sometimes acted beneficially—large effusions acting like a perfect pneumothorax. Scoliosis after a thoracoplasty helps to keep the lung in a collapsed condition, assisting also the circulatory and respiratory balance. He suggested that certain cases of sudden death following the operation might be due to hæmorrhage.

THURSDAY, JULY 26TH.

On the second day, Dr. R. A. YOUNG (London) occupying the chair, Dr. JANE WALKER (London) opened a discussion on the

Social Aspects of Tuberculosis,

with special reference to its infectivity. She said that although tuberculosis is regarded as one of the great killing diseases, being responsible for 10 per cent. of all deaths, it is becoming increasingly clear that the more we know of the disease the more there is to know about it. So far as this country is concerned, the mortality-rate has, however, been falling steadily for the last 150 years and, therefore, cannot be fairly put down to the extra work done and attention paid to it. No doubt the fall is mainly due to causes which have helped to lessen the general mortality-rate, such as the improved standard of living, housing, cleaner clothes, better food, and so forth. But the fall is not constant and is going up in Germany and in Russia, amongst others, and in our own country rose during the war in women, probably as the result of their entering factories in such large numbers, together with the restrictions in food. Too much attention is paid to the seed of the disease, and too little to the soil. Thus the dictum that no big eater ever caught consumption is substantially true and points its obvious moral. For infection to take place contact must be close and prolonged, and the recipient be in a more or less debilitated state. Referring to the recent case—Collins *v.* Hopkins—decided by Mr. Justice McCardie, it is greatly to be regretted that there is no recognised standard, legal or medical, of what constitutes proper disinfection.

Two theories at present hold the field in regard to the spread of the disease: (1) The dose must be massive, intimate, and prolonged; (2) the attack depends on the virulence of the organism. And in both predisposition—i.e., the soil—must not be forgotten. Probably the evidence in favour of the former being the correct view is greater. There is much to be said for the view that, considering the universality of infection, there arises the possibility of a general immunisation of the human organism, as is the case, for example, in scarlet fever; and that the drinking of milk in early childhood containing tubercle bacilli confers immunity. Be that so or not, the clean milk campaign is still one to be encouraged in every way. Tuberculosis is without doubt largely an industrial disease. Treatment in sanatoria has done much good and has cured numbers who otherwise would have been lost to the community, especially amongst the young whose work is still to be done and whose best days are not over. Given to advanced cases it has afforded not only help to the patient but relieved friends and families of anxiety and checked the spread of infection. The value of individual help at the sanatorium in the shape of small talks and advice, the attention paid to a sufficiency of good, wholesome, and yet plain food has been incalculable. Children should have a sufficiently long period of efficient treatment to give them a real chance of acquiring lasting immunity. For the improvement in habits of personal cleanliness, very noticeable in children from the East End, the school medical and nursing services are to be thanked. In general people now live better and certainly drink less. They breathe a less smoke-laden atmosphere and labour-saving devices help to lessen the drudgery of life. We ought to ensure the same good opportunities of treatment to the civilian as to the ex-service man and make satisfactory provision for wife and children while he is away undergoing treatment. Effective after-care machinery is necessary. The question of fitting the patient for particular trades is a difficult one but is being tackled with success at Papworth, Nayland, and other institutions. The establishment of a campaign, comparable to the Framingham Drive in the United States, is an experiment worthy of being applied to this country.

Dr. H. Batty Shaw (London) considered two measures of supreme importance in dealing with tuberculosis: (1) the sterilisation of milk, and (2) segregation of patients, and the removal of children from the source of infection, as there is no evidence that adults, officers of institutions, and so on, take the disease. Segregation of those suffering from tuberculosis is not at all so impracticable a measure as it would seem to be. In any case unless the disease be controlled by the measures indicated all other procedure is useless. The "impure" case of tuberculosis—i.e., tuberculosis in association with other diseases of the lungs—is the dangerous one. Accompanying pneumonia and cavity formation are due to a "mixed infection," and it is impossible to produce these in animals by injection of the tubercle bacillus alone. In a word, tuberculosis of the lungs is really a dual disease, and the term consumption or phthisis should be kept to describe these mixed infections.

Dr. G. B. Dixon (Birmingham) stated that 55 per cent. of children at the age of 5 react to tuberculin and that a survey of 7000 cases in Birmingham gave proof that in a large proportion there were relatives who had either succumbed to the disease or were then suffering from it. Many factors in infection had to be considered. What, for example, are the conditions in infection which at one time will give rise to immunity and at another to serious illness or death? The most vulnerable period of life is the first decade. The measures to be adopted in attempting to control tuberculosis include the protection of the children, reference being made to the Grancher system and the difficulties attendant on its operation, the supervision of known sources of infection, education of the patient and those in association with him, and segregation as far as possible in the patient's own home. Two hundred sleeping shelters are provided to this end in Birmingham. The provision also of a larger number of beds in institutions would be of value, not alone from the nursing point of view, but also economically. Compulsory segregation, however, must be approached with diffidence, though the possession of powers towards this end would form a strong argument in favour of segregation in the patient's own interests.

Dr. J. E. Chapman (London) directed attention to after-care machinery in the struggle against tuberculosis. The occurrence of tuberculosis in a working-class family, particularly if the patient is an adult, is frequently an economic disaster, and care committees, by attending to the economic problem in the cases of individual sufferers and their families, can assist very materially in rendering treatment effective, reducing the risk of relapse and minimising the danger of spread of infection. Unfortunately a variety of circumstances, particularly the war, have retarded the development of these committees. The aim of such a body should be to help the patient to help himself, to give material assistance with the greatest circumspection, and bring him into touch with all local and national agencies which may be able to meet his need. That the committee should have funds at its disposal is desirable but not essential. The unit with which the committee should deal should be the family and not the individual who is suffering from tuberculosis, and, lastly, action should be taken before the circumstances of the family have become disorganised—on the principle that prevention is better than cure.

Dr. C. Muthu (Wells) thought the lack of knowledge with regard to tuberculosis was due to attention being concentrated on the microbe rather than on the man, and the problem is a social, economic, and industrial one. There is a positive correlation between the density of the population and the death-rate from tuberculosis, as was illustrated by figures drawn from London, Glasgow, Dundee, and other crowded centres of population. Thus, also, in India, crowded Bombay presents a higher death-rate than Bangalore, with its garden cities. Among Mahomedan women, secluded in ill-ventilated zenanas, the death-rate is nearly three times as high as amongst men. The more strictly the purdah system is observed the greater the mortality. The experience of the war has shown that when females are subjected to the same influence of occupation the mortality-rate rises as high as, or higher than, the male rate. Tuberculosis is a symptom of poverty, which, with its concomitants of overcrowding and insanitation, undermine the stamina of people so that they fall ready victims to disease. Kaiserling regards tuberculosis as primarily not an infectious disease, but as a disease of nutrition. The soil is more important than the seed, and in India, where tuberculosis amongst cattle is very rarely met with and little or no cow's milk is drunk, nevertheless the disease is very prevalent. Therefore, it is not so much by destroying infection as by attacking social evils, raising the standard of living and thus increasing resistance, that we may hope to eradicate tuberculosis.

Dr. **VERE PEARSON** adverted to the unsatisfactory position in regard to notification which was not fully utilised—e.g., in the examination of contacts and for demographical purposes. Routine measures of disnfection are futile—soap and water, fresh air and sunshine are more important than mere disinfection. Training in the early diagnosis of tuberculosis is mproving though still sadly defective, and there is only one institution in the country devoted to research into the early symptoms of disease, the Clinical Institute at St. Andrews under Sir James Mackenzie.

Dr. **LILLINGSTON** pointed out, with reference to a statement made by another speaker, that though he death-rate in New York from phthisis has allen 50 per cent., that from heart disease has gone up 50 per cent. He suggested that heart disease has, perhaps, become a euphemism for uberculosis.

Dr. A. **NEVILLE COX** (Brighton) asked if spitting is eally a danger. The fact that in Brighton obserration had shown that only a proportion of deaths from tuberculosis amongst children occurred n cases which had been in contact with open nfection at home, argued that the children might well have become infected by playing about in he streets, the only nursery for many of them. Attention was drawn to the possible spread of nfection by dogs and flies. Calling attention to ertain legislative defects, he advocated the extension f the provisions of the Factory Acts to offices, &c., which, under the present conditions, are subject to o supervision.

Dr. J. A. **WATT** (Derby) was satisfied that on the whole the tuberculosis services act efficiently and uickly, though dispensaries, lacking X ray apparatus nd other things, are not by any means properly quipped. So far as care committees were concerned e thought these should be self-contained and he bjected to having to go to other organisations for unds.

Dr. R. **ROBERTSON** (Ventnor) considered that if an nlimited purse were at our disposal tuberculosis would soon be overcome. It should be a matter for he M.O.H. and the tuberculosis officer to evolve an deal method of disinfection.

Dr. G. **FLEMING** (Farnham) pointed out that the all in tuberculosis mortality as manifested by the raphs exhibited, began long before sanatoria and ther similar measures for the treatment of the disease xisted, and wondered, therefore, if the methods arried out in the last 30 years had been of real dvantage in the treatment. Perhaps the advanced ase was much less dangerous from the point of view f infection than the open case in an earlier stage and t work. Money would be spent with greater benefit y concentrating on the treatment of the earlier ages. After all, care committees are only doing hat the State itself should do. The tuberculosis officer hould be trained in general practice as well as in his pecial work and should make it his duty, either ersonally, or by his staff, to investigate the home onditions of every notified case.

Dr. T. E. **WHITE** (Catford) thought that to await he finding of tubercle bacilli in the sputum was o late and desired to know, therefore, when case became notifiable. The doctor in attenance cannot always be held responsible for late otification.

Dr. **MILLER**, speaking as an M.O.H., considered the ifficulty in regard to early notification could be got ver if the general practitioner would only call in the uberculosis officer more frequently.

The **PRESIDENT**, summing up the discussion, eplored the great lack of knowledge regarding the iology of the tubercle bacillus, nor will the disease e stamped out until we learn more concerning the roduction of immunity and the response made by he human subject to infection.

Dr. **JANE WALKER** replying, believed that we should have to come back to Koch's view that there was no danger at all in milk containing bovine tubercle bacilli, while the longer she lived the less she believed in measures of compulsion.

SECTION OF OPHTHALMOLOGY.

THURSDAY, JULY 26TH.

THE morning session was devoted to a discussion on the

Clinical Significance of Scotometry.

Sir **JOHN PARSONS** (London), President of the Section, having, in accordance with precedent, vacated the chair in favour of the Vice-president, Mr. **RANSOM PICKARD** (Exeter), the discussion was opened by Mr. A. H. H. **SINCLAIR** (Edinburgh), who showed an interesting series of charts obtained by Bjerrum's method. He pointed out that scotometry furnished a striking example of the help given in the early diagnosis of disease by the minute study of subjective symptoms. Bjerrum, of Copenhagen, had given us the most delicate and accurate method of estimating areas of relative failure of vision, especially in the more central part of the field. By diminishing the size of the test object used, and at the same time increasing the working distance to 2 metres, his method made it possible to demonstrate small areas of slightly depressed vision, which would otherwise escape notice. A practised and experienced observer could by this method demonstrate upon Bjerrum's screen the course of the large blood-vessels of the retina for some distance from the blind spot. Yet, when familiarity with the method had been gained, it had been found sufficiently rapid for use in out-patient work at Edinburgh. It should be remembered, Mr. Sinclair said, that the blind spot of Mariotte was normally surrounded by an amblyopic zone measuring about 1°; in many cases irregular projections of this zone, above and below, were found normally, which corresponded in position with the points where the large blood-vessels left the disc. One point of importance was the direction of movement of the test object; if moved from the blind to the seeing area, the scotoma would appear larger than if the reverse direction—moving the test object from the seeing area to the blind area—were adopted. It was usual to record the intermediate point between these two observations. A curious phenomenon occasionally observed under certain conditions was that a red object might appear green (its complemental colour) in the peripheral part of the field, but was recognised as red when brought nearer to the fixation point.

In tobacco amblyopia, failure of the light difference sense and paracentral scotoma were constantly present. The scotoma had the following characteristics: bilateral, irregularly oval in shape, extending from the blind spot to the fixation point, which it included, and presenting "areas of greater saturation or density." Debilitating conditions, such as influenza, overwork, diabetes, rendered a patient more susceptible to tobacco amblyopia. If a paracentral scotoma of the type described was met with in a smoker who was a diabetic he should always be advised to stop smoking. Tobacco amblyopia was uncommon in cigarette-smokers, but a chart was shown of a case due to smoking 25 cigarettes daily, with inhalation.

Another chart showed a central scotoma due to cocaine, where the habitual excessive use of cocaine sprayed into the nose had followed its use for some nasal condition. In disseminated sclerosis failure of vision is often an early symptom, and a central scotoma may be present without any contraction of the peripheral field. The most important characteristic of the scotoma in such cases was its tendency to change, to disappear, and reappear.

The early diagnosis of glaucoma had been greatly aided by scotometry. The old saying, "No scotoma, no glaucoma" was true as a general rule, though exceptions did occur. "Bjerrum's symptom," characteristic of glaucoma, might be stated as follows: "The area of normal or most fully preserved vision, as also the area of relative defect, are in contact with the blind spot, or may be said to meet at the blind spot of Mariotte." Or, in other words, "a peripheral area of relative defect can always be traced up to the blind spot provided a sufficiently small test object be employed, and the area of most fully preserved vision is always in contact with, but does not surround the blind spot." (Charts illustrating these points were shown.) In the vast majority of cases of glaucoma relative field changes appear early, and their recognition is of great importance. Mr. Sinclair said that the earliest changes found may be of three types: (1) shrinkage of the 1/2000 field; (2) expansion of the amblyopic zone round the blind spot of Mariotte, which may "break through" to become continuous with a more peripheral defective area; (3) arcuate scotomata, connected with the blind spot, or separate from it. The observer must not be misled by the normal projection of the amblyopic zone, due to the large blood-vessels, already referred to.

Retrobulbar neuritis with central scotoma may result from orbital disease or disease of the accessory nasal sinuses. When the optic nerve is involved, in the optic canal, from disease of the neighbouring sinus, central scotoma is an early symptom. In such a case the scotoma usually affected one eye only, appeared suddenly or developed rapidly, and might be pericentral, or paracentral including the blind spot. The amblyopic zone around the blind spot might be greatly extended. The negative characteristics of the scotoma in these cases were of importance; it had not the areas of saturation characteristic of tobacco, nor the quadrantic formation of a scotoma from a chiasmic lesion. Rhinological and X ray examination were required to locate the lesion of the nerve, which could not be determined from study of the scotoma alone.

Bitemporal hemianopsia occurred in typical form in connexion with tumours of the pituitary body. In some of these cases central vision was affected early, and a quadrantal scotoma could be demonstrated. Such cases tend to run a more rapid course than those in which central vision is not affected till the later stages. Mr. H. M. Traquair had described in detail the course of the development of this quadrantal defect, which was difficult to explain. In conclusion, Mr. Sinclair said that it must be remembered that the valuable evidence afforded by scotometry must always be considered, not by itself, but in association with the evidence from other modes of investigation.

Dr. M. **Gordon Holmes** (London) emphasised the importance of personal factors in this class of work, both in the patient, and still more in the observer. The patient must be made to understand accurately what is required of him and, when once this is done, he should not be questioned during the examination, as his attention will be distracted if this is done. For the same reason all noise, all unnecessary movement, should be avoided. The noise made by most self-registering perimeters was a great objection to their use. More accurate results were obtained by objects moved by the observer's hand. It was important to make friends with your patient, to interest him in what was being done, and to avoid fatiguing his attention. Lastly, "the observer must be careful to maintain an attitude of intellectual honesty"—a difficult matter in a prolonged investigation. To this end it was best not to have before one the result of a former investigation.

Mr. **Malcolm L. Hepburn** (London) showed charts of fields and scotomata in cases of choroidal affections, including under this heading pigmentary degeneration of the retina. For this latter condition, "Raynaud's disease of the choroid" had been suggested as a suitable name. Observation of these cases had led to the conclusion that as long as there was any remainder, even if it were a comparatively small island, in the lower temporal field (usually the last to be lost) the patient would not suffer complete loss of central vision. These patients should be advised never to emigrate to a cold climate.

Mr. H. **Neame** (London) showed a series of charts from a case of pituitary tumour, which illustrated in a striking way the variability of the scotoma—a point recently emphasised in De Schweinitz's Bowman lecture.

Mr. N. **Bishop Harman** (London) called attention to the importance of rapid work. Bjerrum's method made great demands on time and patience. Movement should be from the blind to the seeing area. Speaking of tobacco amblyopia, he gave it as his impression that cases were far less numerous than formerly; also, that it was possible in these cases, by varying the amount of light, to get evidence of depression in the peripheral field.

Sir **John Parsons** emphasised the fact that an amblyopic zone round the blind spot is a perfectly normal phenomenon.

Mr. **Pickard** showed charts of cases presenting unusual features difficult of explanation. The first series were cases of chronic glaucoma where the limitation of the field was concentric, and the blind spot showed little or no enlargement, central vision being normal. His impression was that in these cases the outlook was better than in cases showing marked enlargement of the blind spot. A second series of charts were shown from cases where a similar concentric limitation of the field was due to functional causes; in one of these some enlargement of the blind spot was present. These cases, taken together, illustrated the difficulty that confronts the ophthalmic surgeon in distinguishing between such functional cases and those of early glaucoma with little or no increase of tension. Other charts of atypical cases of glaucoma were shown. Attention was called to the fact that in two of these bacilluria was present. In his experience this was not infrequent, and was, in his opinion, a distinct factor in the causation of glaucoma.

Mr. **Sinclair**, replying on the discussion, said that relative defects in the field were apt to vary from time to time. Given an experienced observer, and an intelligent patient, work with Bjerrum's screen could be done quickly. In regard to tobacco amblyopia, he was of opinion that the peripheral field showed remarkable freedom from restriction.

Exhibition of Cases.

In the afternoon the members of this section visited the Portsmouth Eye and Ear Hospital, where, in addition to other cases of interest, Mr. W. S. **Inman** showed a number of cases illustrating the close connexion between squint and emotional factors. Incidentally it was mentioned that there were no less than 1500 cases of squint among the children of the Portsmouth elementary schools. The cases demonstrated by Mr. Inman were selected as showing the liability of the squint to vary from day to day, and the presence, in their parents or other relatives, of such symptoms as stammering, left-handedness, and alopecia areata. A case was shown in which a transient nystagmus was produced by covering one eye. In other cases squint had either followed or disappeared after a fright or accident. Most of the cases selected for demonstration appeared to be of neurotic temperament. In the informal discussion of these cases it was pointed out that accurate statistical records would be necessary to place beyond doubt any direct causative connexion such as these cases suggested.

Friday, July 27th.

The morning was devoted to a discussion on

Ophthalmology in Relation to the Navy, Army and Air Force.

Sir **John Parsons** took the chair, and special prominence was given to the problems arising in connexion with the Air Force.

Air-Commodore D. **Munro** said they had come to regard inequality of the eyes as dangerous. This was probably also a cause of failure to excel in such games as golf. Most people had "a master eye"; if this was so, it implied that the other eye "lagged behind.'' One eye began by being the better of the two, and the other eye got careless, and neglected. Apart from refraction, a possible explanation was that one eye was better supplied with rods and cones than its fellow, or the visual cortex on one side was better supplied with pyramidal cells than on the other side. Heterophoria, in the Air Force, had come to correlate something more than imperfect muscle balance. It implied bilateral disharmony: the brain was striving to fuse into one two pictures, of which one was better than the other and contained more detail. Their aim was not only to train binocular fusion but also to train the worse eye. "A man with only one eye is, to us, less dangerous than a man with two useful eyes with marked inequality between the two." A one-eyed pilot has his own ways of judging distances, for example, by movements of the head, so as to get an observation from two slightly different angles. Two of the best pilots he knew were practically one-eyed men. To Clements was due the credit of bringing to their notice the importance of orthophoria. Training based on this view had given encouraging results. A striking series of cases of "bad landers" had been improved. In some cases the improvement was so great that the men had later been singled out on account of their special aptitude. The effect of glare in aggravating these defects was of great importance. It led to fatigue of the accommodation, interfering with accommodation and convergence, and aggravating any imbalance of the ocular muscles.

Wing-Comdr. E. C. **CLEMENTS** detailed the steps by which he had arrived at his present conclusions and methods. Before the war he had become interested in a special group of cases, complaining persistently of asthenopia, in spite of repeated changes of glasses. In this group he was impressed by the large proportion of engineers' draughtsmen, men whose work involved frequent use of a sliding rule. Some of these men had automatically got into the habit of closing one eye, finding that they could work better n that way. Later on, in the war, men in the Air Force were sent to him because they could not land properly. When allowed to investigate, he made the startling discovery that about 80 per cent. of all "crashes" at a teaching aerodrome were due to bad andings. An independent investigator estimated the percentage at 70 per cent. On examining these men he was struck with the resemblance to the group of cases first mentioned. All the cases showed evidence of imbalance, and some cases also of suppression. Whereas some six hours in the air, training with an instructor, was found ample for most pilots to enable them to go "solo," many of these "bad-anders" had had about twice as long air training, without reaching such proficiency. "We have to consider a man in the air and not on the ground. It s a totally different problem. From infancy upwards, you have made all your judgments standing on the ground."

In the air unknown quantities complicated the problem. You did not know your distance from the ground. You were a moving object: you were not in contact with the ground. Centrifugal force sometimes complicated matters. For example, in doing a quick "spin" in the air, the eyes tended to be pulled out of their sockets, and, on coming out of the spin, he effect of centrifugal force would take a little time o pass off and allow the ocular muscle balance to ecover itself. It was quite possible for a man to y northwards into a cloud, and to come out of it ying southwards, and head-downwards, without nowing it. To those who did not agree with him s to the importance of heterophoria he would say: "Then let us call this important factor, whatever it is, *x*, and study facts." The clinical fact was that fter the training adopted many bad landers had ecome safe and efficient pilots.

Speaking of the methods of examination followed, he pencil test was used for convergence, bringing it radually nearer till one eye began to wander away: if this happened at a distance of less than two inches, onvergence was considered very good: if beyond four inches, poor; from two to three inches, good. With this test they found three things might happen: one eye might wander out; or both eyes might swing outwards together, or the patient would get a feeling of pain and resistance, and draw back his head. The possession of considerable reserve power of convergence was desirable, whatever the explanation might be. The red-green test was used for measuring deviations. In exophoria and esophoria, 2½° of the one and 1½° of the other were regarded as unsatisfactory. If only one "omnibus" test were available, he would prefer Bishop Harman's movable diaphragm test. In regard to training, the first point was the breaking down of bad habits, and then setting up the good habit. It was no good giving a man an amblyoscope or stereoscope to take home for a week and then to come back and report progress. Daily supervision of these men was necessary, otherwise they were liable to fall into wrong methods in their endeavours to improve. Similar training would in his opinion benefit certain cases in civilian practice.

General Sir W. G. **MACPHERSON** was invited by the President to open the discussion on behalf of the Army, and gave a brief sketch of the way ophthalmic questions had been dealt with, from the old days when it was enough if a recruit could see the bull's-eye on the target at 600 yards up to the present day. In regard to ophthalmology the Army had not gone into it in the same way as the Air Force had done.

Major J. H. **GURLEY**, dealing with visual standards required of recruits, pointed out the waste of money consequent on an unsatisfactory standard; an ill-chosen standard led to numbers of men being discharged from the Army some months after enlistment, on account of inefficient vision, and their period of abortive training cost the country roughly 10s. per day for each man. In his opinion the 1920 standard was the best, leading to the smallest wastage of this kind; it was 6/18 in each eye, capable of improvement to 6/12, 6/6 with glasses. Unfortunately, it had had to be relaxed, as too few men were offering for enlistment.

Mr. **RANSOM PICKARD** referred to the question of night-blindness, and the bearing of hypermetropia and eyestrain on it.

Surg.-Comdr. W. K. D. **BRETON** spoke of the tests employed for gunlayers in the Navy; muscle imbalance of 2° led to rejection. He had refracted under a mydriatic a number of cases of men unable to read 6/4 partly, and found in most of them slight cylindrical defects.

Major M. W. B. **OLIVER** said night-blindness had been one of the commonest causes of malingering in the war, after it had become known that men were discharged on account of it. There was great scope for investigation of this subject with a view to providing some satisfactory test. In the war men had been sent into the front line, who were useless and dangerous to others, if their glasses got lost or broken. Protection of the eyes was a question that would have to be dealt with in the future. Triplex glasses might prevent many cases of injury to the eyes from splinters.

Mr. **BISHOP HARMAN** (London) referring to imbalance, described a personal experience of a hyperphoria of 2° becoming evident in consequence of digestive trouble.

Mr. E. E. **MADDOX** (Bournemouth) emphasised the importance of a sound nervous system in connexion with the cases under discussion; "mental coolness and freedom from mental flutter" were requisite. Abdominal disturbances certainly might influence muscle balance. During an attack of intestinal irritation his own physiological exophoria was changed to esophoria; worms in children produced at times a similar effect; in both instances a severe centripetal impulse was operative. He was in agreement with the figures quoted by Mr. Clements in regard to convergence. The question was not so much whether a man was able to converge his eyes, but of the delicate judgment of the amount of convergence exercised, and the inference from this as to distance. A number of other factors came into play, for instance the apparent expansion of objects in size as you get nearer to them.

Squadron-Leader J. F. CARRUTHERS spoke of the advantage it had been to work with Clements at Hampstead for four months. He had been astonished at the way in which cadets who had crashed over and over again, and broken several aeroplanes, became safe pilots. Facts like that could not be got over however much they might differ on questions of theory. He strongly urged Mr. Clements to publish his unique observations and experiences of the last few years.

Major WRIGHT from his experience in India doubted whether glare was so important a factor as had been stated.

Sir JOHN PARSONS spoke of the complexity of the problem and the extraordinary value of research, as illustrated by Mr. Clements's paper. Once research was begun new problems continually presented themselves. Such a simple question as the relation of visual acuity to musketry had never been adequately investigated. It was a fortunate thing for ophthalmology that the investigations begun in the Air Force in the war had not been stopped by the powers that be. Mr. Clements had touched the crux of the matter when he said that we were accustomed to walk about on land, and flying presented totally different problems. Expensive machines and still more expensive lives were affected by the outcome of these investigations. He differed on some points from Mr. Clements, but the important point was that he had done most valuable work, carried out in a scientific way, and had set an example in regard to these problems that were arising. Splendid work had been done by the Industrial Fatigue Board and by the Institute of Industrial Psychology. The Government could find money and men to carry on these researches which they considered necessary for industry. Money should be available for investigations in the Navy and Army. The proper time for these investigations was in peace-time. When war came, men were asked to give an opinion when they had not always the proper data and material on which to base an opinion. We must emphasise to the Government the need of proper research being done in peace-time on these problems of the naval and military services. Our aim should be the setting up of a definite research department, financed and maintained by the Government.

Commander CLEMENTS, in reply, pointed out our ignorance of the essential nature of the fusion sense. He stated that in the construction of aeroplanes visual conditions had not been studied. Some aeroplanes were "blind-right" and some were "blind-left." A point of interest was that sometimes the red-green test would show esophoria, but, if you fatigued the patient, he would then show exophoria; this must mean that such a patient had a big reserve power and had got into the habit of over-correcting his defect. One remarkable thing in his experience had been the freedom from relapses.

A resolution was proposed by Sir JOHN PARSONS and seconded by Mr. A. C. ROPER (Exeter) recommending the Council of the British Medical Association to press strongly on the Government the great need for research. This was carried unanimously.

Major E. B. SPAETH, U.S. M.C., demonstrated a number of interesting diagrams, photographs, and drawings of plastic operations on the eyelids.

TUBERCULOUS CATTLE AND BLACK PUDDINGS.—Burnley Town Council, on August 29th, passed a resolution instructing their medical officer of health to report as to whether it was customary to allow the blood of tuberculous cattle to be used in the manufacture of black puddings, and what were the dangers of using the blood in this connexion. The Mayor, Dr. J. W. Clegg, said that out of 21,231 animals slaughtered last year only nine were affected and the carcasses destroyed. In the boiling of black puddings a longer time was taken and a greater heat generated than was necessary to kill the germs of tuberculosis. The danger from contamination was practically non-existent.

Reviews and Notices of Books.

A MANUAL OF HISTOLOGY.

By V. H. MOTTRAM, Professor of Physiology in the University of London. London: Methuen and Co. 1923. With 224 figures. Pp. 294. 14*s*.

THIS book is meant to be the companion of the student of physiology while he works through his first elementary course in microscopical anatomy. It should admirably serve its purpose. It is in no sense a book of reference, but it ought to be of real help in enabling the young to get what they so often miss—a sound dependable acquaintance with the commonplace and ordinary elements of the subject. As the author says, his design has been to make a book on histology with diagrams which he could set before a student who asked what to look for under the microscope, and his simple line drawings printed in the text will really help the beginner towards reality better than more elaborate pictures or half-tone reproductions of microphotographs. We may confess that we had not realised that any book could be better calculated to guide first footsteps than Sir Sharpey Schafer's great classic. The difference seems to be that the "Essentials of Histology" is at once an elementary manual of instruction and a book of reference which may be relied on throughout a man's career; Prof. Mottram does not attempt to satisfy the latter requirement, and in consequence makes a better job of the former need. There are a few mistakes: the ratio of red cells to leucocytes in the blood is 500, not 50 (p. 85); malaria does not cause an eosinophilia, and the "mast cells" of the rat's connective tissue are very doubtfully homologous with the "mast cells" of human blood (p. 83).

The only serious criticism which we would make is of the publishers rather than the author. The volume is much too big and clumsy, being printed on thick, soft paper in type unnecessarily large and with considerable margins. It is of the utmost importance that a manual for laboratory use should be easy to carry about; if it is not, the student will leave it in his drawer instead of putting it in his pocket to look at on the way home. Producing a book in a form in which it "would be an ornament to any gentleman's library" may promote the sale of collected editions of standard authors, but it is the last thing that is wanted in books of daily utility. The price of the present volume is, as such things go nowadays, not unreasonable; students of physiology are not so stupid as to pay it any more readily for a large and inconvenient piece of apparatus than for a handy useful companion.

EPIDEMIOLOGY AND PUBLIC HEALTH.

By VICTOR C. VAUGHAN, M.D., LL.D., Emeritus Professor of Hygiene in the University of Michigan. London: Henry Kimpton. 1923. In three volumes. £6 15*s*. Vol. II.

IN this second volume of Prof. Vaughan's work an attempt has been made to group the diseases according to the avenues through which the virus reaches and infects the body; it is, as the author says, only partially successful, as some epidemic diseases have no specific virus and others have multiple avenues of infection. The first group—Nutritional Disorders—includes the definite deficiency diseases, scurvy and beri-beri, and others, the classification of which is still doubtful, such as rickets, pellagra, and goitre. The second group—Alimentary Infections—includes all forms of food poisoning, botulism, the typhoid fevers, cholera, the dysenteries, sprue, Malta fever, and various animal parasitic infections. The third group—Percutaneous Infections—takes in malaria, yellow fever, dengue, tetanus, plague, typhus fever, the relapsing fevers, anthrax, rabies, rat-bite and snake-bite fever, the trypanosomiases, framboesia, the kala-azars, &c. A very full and interesting history of each disease is given, together with the various opinions which have been held at different times as to its ætiology. Many quotations are offered from various authorities on each disease, but unfortunately these quotations are usually undated. This defect may generally be made good by consultation of the bibliography at the end of the chapter, but is rather an important omission in the case of diseases with regard to which views of individuals are changing almost from day to day. For example, McCarrison is credited with the belief that endemic goitre is due to a living organism, and a detailed statement of his argument and an undated quotation are given in support of this belief. It is probable that McCarrison now attributes much more importance to the iodine factor. The chapter on rickets is not as full as some of the others. One of the recommendations for the prevention of rickets—"The child should be kept in the open air with free exposure of the greatest possible extent of its body to the direct action of sunlight for at least three hours a day in order to facilitate the digestion and absorption of food"—suggests a more obliging sun and a better tackled smoke problem than we can boast of in this country. The chapters on malaria and yellow fever are, as was to be expected, especially interesting.

This work is a careful and painstaking effort to bring our knowledge of these diseases up to date, and we can cordially recommend it as a useful book of reference and a valuable addition to the library of any medical man.

SOCIAL MEDICINE.

Les médicins sociologues et hommes d'état. By P. TRISCA. Paris: Felix Alcan. 1923. Pp. 224. Fr. 10.

THE gist of this interesting little book is that the evils from which the world is suffering might be greatly lessened if medical men set themselves to impress upon governments that the crying need is for public health in the widest sense—not only the prevention of zymotic diseases, but the regulation or abolition of drunkenness, syphilis, and tuberculosis, together with provision for healthy housing. Dr. Trisca sets a high standard for medical men—they should be strict abstainers and should never smoke; the end of the medical profession should not be money-making. This may be ideal, but yet medical men must live, and Dr. Trisca does not clearly explain how it is to be brought about. The first portion of the book is mainly taken up with short biographies of various medical men in different countries who have interested themselves in social matters or who have sat in Parliament, and the author casts his net wide, for he includes Darwin, Locke, Rabelais, and Quesnay.

We wonder a little that he has not mentioned Renaudot, who in 1631 started the first French newspaper, the *Gazette de France*. Renaudot practised in Paris and was the originator of the Monts-de-Piété, where the poor could obtain small loans on small security, and also of intelligence offices where they could obtain advice on medical and allied matters.

Though Dr. Trisca's maxims are counsels of perfection, he has certainly set an ideal which it would be well to follow.

LOEB CLASSICAL LIBRARY.

Hippocrates. Vol. I. With an English Translation by W. H. S. JONES. London: Heinemann. 1923. Pp. 362. 10*s*.

THIS volume contains the following Hippocratic treatises: Ancient Medicine; Airs, Waters, Places; Epidemics I. and III.; The Oath; Precepts; Nutriment. The selection, says the translator, "is intended to be typical of the whole Hippocratic *Corpus;* in it are included works belonging to the chief classes of which the collection is composed." Of these, the two last, though included in the Corpus, are almost certainly not genuine works of Hippocrates—i.e., of the author of Aphorisms, Epidemics I. and III. and of Airs, Waters, Places. In addition to his translation Mr. Jones supplies a most interesting introduction dealing with the Hippocratic collection in general and with the meanings of various medical terms. There is also a separate introduction to each individual treatise and in particular that to Airs, Waters, Places gives a clear account of the meaning of the terms heliacal, cosmical, and acronycal, as applied to the rising and setting of stars or groups of stars for the purpose of identifying the beginnings and ends of the seasons. We are glad to find this explanation, for many editions of the classics never give it—for instance, hardly any school edition of the Georgics does. An honourable exception to the general neglect is Prof. A. W. Mair's translation of Hesiod. Unless the reader is acquainted with the technical meanings of the terms "rising" and "setting" a passage such as this from Airs, Waters, Places XI. is meaningless: "One must also guard against the risings of the stars, especially of the Dog Star, then of Arcturus, and also of the setting of the Pleiades."

It is no doubt difficult for a busy medical man to find time to read Hippocrates, but if he should be able to do so, he will find no better translation than the volume before us. We look with interest to the coming of the remaining volumes.

BUGS.

A Biology of the British Hemiptera-Heteroptera. By EDWARD A. BUTLER, B.A., B.Sc., F.E.S. London: H. F. and G. Witherby. 1923. Pp. viii. and 682. £3 3*s*.

THIS handsome volume contains a very full account of the life-histories, so far as they are known, of the species of the suborder of Hemiptera-Heteroptera, or typical bugs, that are found in Britain, and in each case the life-history includes, as far as possible, not only the manner of life and the distribution and seasonal prevalence of the adult, but also corresponding particulars of the larval stages, and necessary details regarding the egg.

In excluding taxonomy and generic and specific diagnoses the author has impaired the usefulness of his work. His statement that the beak of bugs is used as a piercing organ is too general; the beak is not so used by the bed-bug, but is arched backwards to give exclusive play to the slender suctorial tube formed by the mandibles and maxillæ. In his account of the organs of Berlese and Ribaga—those curious structures peculiar, so far as is known, to females of the bed-bug—he has unfortunately overlooked the extraordinarily interesting work of Major F. W. Cragg—work full of suggestion equally to the biologist, the physiologist, and the pathologist. Cragg has shown that these organs, though distant from the genital apparatus and not possessing any obvious ducts, receive the exuberant spermatozoa from the male and filter them into the body cavity of the female insect; that the spermatozoa pass from the body cavity into the spermathecal chambers through the walls of the latter, and that they pass on to the ovaries not in the lumen of the oviduct but in the substance of its wall. Apparently only a small number of the spermatozoa reach the ovary, and the great mass of them are destined for some work other than fertilisation of ova. The author merely repeats Berlese's opinion that the organ bearing his name appears to ingest and destroy the excess of spermatozoa, although the evidence of Cragg's observations was published, in 1920, in the *Indian Journal of Medical Research*, and was demonstrated in London in 1922.

The book is a useful introduction, though without any such express intention, to a group of insects that is full of interest to the medical profession. For the facts that the bed-bug is a potential agent for the transmission of disease to man, and indeed in the case of kala-azar is reasonably suspected of operating effectively in such transmission, and that certain reduviid bugs are demonstrated intermediaries in the propagation of Chagas's trypanosomiasis in South America, bring the suborder definitely within the domain of medicine. The facts, again, that several species of bugs are copiously infected with flagellate protozoa akin to certain common and disastrous blood parasites of man in tropical countries, and that some of these bugs are known to owe their infection to plants, like spurges and dog-banes, that have a milky sap, invest this suborder with an interest which, though at present predominantly speculative, is seriously attractive to the pathologist. Furthermore, to the student of parasitology a group of insects that provides such an easy supply of flagellate protozoa for experimental work should be particularly alluring.

Early Diagnosis of the Acute Abdomen.

Second edition. By Zachary Cope, B.A., M.D., M.S. Lond., F.R.C.S. Eng., Surgeon to Out-patients, St. Mary's Hospital, Paddington; Senior Surgeon to the Bolingbroke Hospital, Wandsworth Common; late Hunterian Professor, Royal College of Surgeons. Oxford Medical Publications. London: Henry Frowde and Hodder and Stoughton. 1923. Pp. 223. 12*s.* 6*d.*

In this second edition of a valuable little work few changes have been made, but they considerably enhance its practical usefulness. The general arrangement of the work is unaltered. It is of interest to note that the author lays stress upon a fact which is often overlooked—namely, that free fluid within the peritoneal cavity may be simulated by dilated coils of intestine which will not only give dullness in the flanks but a dullness which shifts with the position of the patient. Important changes have been made in the description of the areas of superficial tenderness which may be met with in cases of appendicitis, and the author's account is now more in conformity with that usually given. The method of estimating the area of hyperæsthesia by means of a dragged pin is now advocated in preference to pinching a fold of skin. The area in which such hyperæsthesia is found is one lying parallel to the right Poupart's ligament and just above it and is dependent upon the distension of the viscus. Sufficient stress is hardly laid upon the fact that the sudden disappearance of this area of hyperæsthesia is one of the earliest signs of perforation of the appendix. Although attention is directed to the importance of early diagnosis of perforated gastric or duodenal ulcer that group of cases in which the onset is gradual and where the patient may walk up for advice is not given much prominence. In such cases the pulse may be only 60 and the patient may show no signs of primary shock, although there is already much rigidity of the rectus.

The book is an extremely valuable guide to all holding positions as house surgeon or who have recently entered general practice. As such it has evidently enjoyed a popularity which the present edition will increase.

Blood and Blood Diseases.

Blutkrankheiten und Blutdiagnostik. Von Dr. Med. Otto Naegeli, Professor der Inneren Medizin an der Universität Zürich. Vierte Auflage. Berlin: Julius Springer. 1923. With 25 coloured plates. Pp. 587. £1 5*s.*

Prof. Naegeli's book requires no introduction to hæmatologists in this country; since the appearance of the first edition it has remained one of the most useful works of reference extant on blood and blood diseases, and this, the fourth edition, will serve to confirm it in its place. Notice has been taken of most recent work of importance on the subject, and several new sections and many illustrations have been added.

Of the new matter contained in this edition some of the most interesting is that in the section on the Hæmorrhagic Diathesis, under which head the author groups together all conditions in which purpuric manifestations play a part; this results in bringing some very diverse conditions into juxtaposition, and since a few glimmerings of light have of late years been thrown on some of the underlying causes of the various conditions described, it is questionable if this arrangement is now quite justifiable. It is not conducive to any true understanding of the matter to find Goldmann's Hereditary Hæmorrhagic Telangiectases standing at the head of a list which includes also Avitamosis, Anaphylaxis, and Hæmophilia. In this section, however, Prof. Naegeli does good service in calling attention to the importance of the blood platelets in purpuric conditions; in those associated with a withdrawal of these bodies he makes a sharp distinction between "benign" or idiopathic forms and those secondary to an infective process which he calls "malignant"; to the former he would apparently limit the term "Werlhof's disease"; the latter he regards as examples of the "aleukia" of Frank. The blood platelets in fact receive throughout a consideration from Prof. Naegeli in pleasing contrast to their treatment by many authors in this country. The choice of the dry-slide method of Fonio for counting them, however, was not fortunate; whatever may be said as to the relative accuracy of the methods, the wet method is far easier to carry out. The 25 plates in colour at the end of the book are a valuable feature; their subjects are happily chosen; the original drawings by R. Sarno of Naples were evidently well done and their reproduction is pleasing. The book contains a voluminous and useful bibliography.

The Periodontal Tissues.

Lectures on the Diseases of the Periodontal Tissues due to Infection in their Relation to Toxæmia. By J. H. Mummery, J. G. Turner, Sir William Willcox, and Prof. E. E. Glynn. London: Dental Board of the United Kingdom. 1923. Pp. 96. 2*s.* 6*d.*

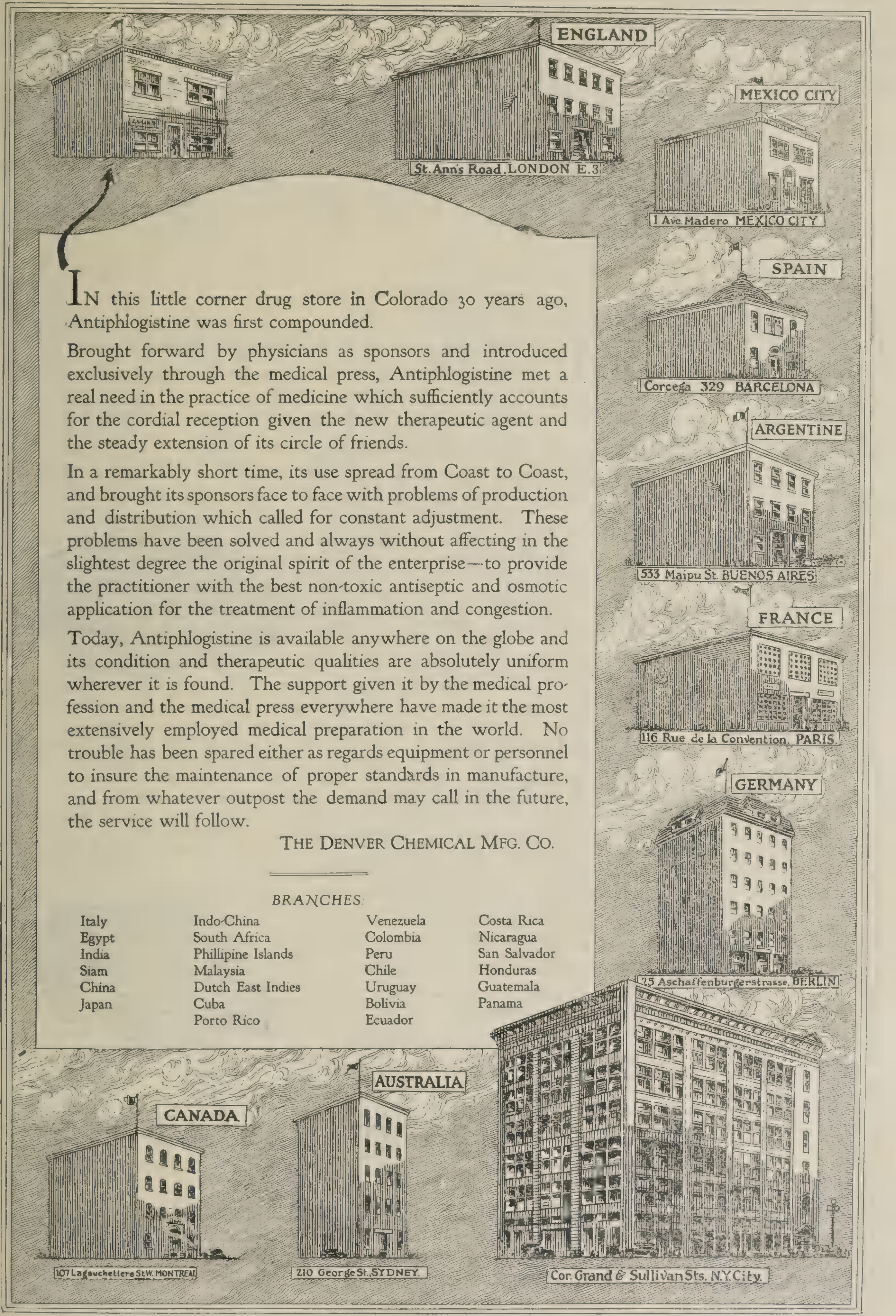
The Dental Board has done well to publish the four lectures on periodontal disease which were delivered at various centres during the earlier part of the year. They contain matter of great interest, much of which does not find any place in the various text-books. There is a special significance attaching to the appearance of this book, for it represents the beginning of post-registration teaching carried out as a part of the duties of the official body which controls the dental profession. Though this book does not pretend to be a complete manual on pyorrhœa, yet within a space of less than 100 pages it covers a very wide field. The patho-histology is dealt with by Mr. Mummery in a comprehensive manner. Mr. Turner contributes the lecture on the local clinical symptoms, which in the extent and accuracy of its observations could hardly be bettered. The systemic effects are discussed by Sir William Willcox on the lines made familiar by previous contributions from this writer. The bacteriology of pyorrhœa is dealt with by Prof. Glynn. Of all aspects of pyorrhœa this is, perhaps, the most confusing. Though Prof. Glynn cannot assign any specific organism to this disease his chapter is a masterly review of the subject. It is no disparagement to the other writers to say that this chapter is the most notable feature of the book, which would be well worth buying on its account alone.

Since pyorrhœa plays a not unimportant part in general medicine, this volume may be commended to both medical and dental practitioners as a sound and comprehensive review of the present state of our knowledge of pyorrhœa.

The Secret Journal of Charles Dunbar.

By J. Maconechy. Collins. Vi. + 276 pp. 7*s.* 6*d.*

An instance of hereditary ability marks the authorship of this recently issued novel. It depicts the life of a country parson and his conscientious endeavours to perform the duties of his profession, though realising the limitations of his religious convictions and belief; a position which appeals to many outside the clerical circle, and in particular to men of science. The book relies upon the study of character, rather than plot, for its interest, and should recommend itself to the medical profession as the work of a direct descendant of the sister of William and John Hunter.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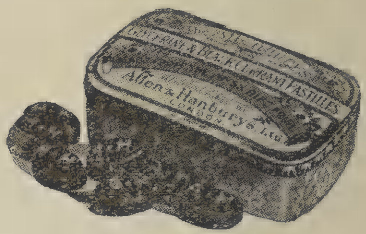

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[*See also pp.* 14 *and* 21.]

THE LANCET.

LONDON: SATURDAY, SEPTEMBER 8, 1923.

THE EARTHQUAKE IN JAPAN.

THE appalling disaster which befell the middle island of Japan last Saturday has evoked the active sympathy of the civilised world. The disaster was not without precedent or altogether unexpected. There is a yearly average of 96 perceptible shocks in Tokio, and every Japanese boy or girl is brought up to expect one severe earthquake in his or her lifetime. It was after the last severe quake in Tokio that the seismographic station was opened which has added so much to our knowledge of movements in the earth's crust, but shock followed shock so rapidly on Saturday that the instruments can only have recorded their own destruction. Position on a low seaboard still further imperils Japanese cities, situated, as they already are, on a direct line of stress, the result of a specially sharp fold in the earth's crust; for, just as in Calabria, at San Francisco, and on the Mexican seaboard, shock was followed by fire, and fire by tidal wave. The great Indian earthquake of 1897 which crossed a continent would have produced fearful devastation had not the country traversed been wild and sparsely populated. We may trust that the high level of civilisation was sufficient to prevent the mad orgy of riot and rapine which has followed on such catastrophes under less favourable circumstances, for the rapid development of Japanese culture has hardly been less astonishing than the local changes in the earth's crust which caused the disaster. Immunity from considerable vibration during recent years had made experts apprehensive that seismic disturbance, when it should reappear, might be of special severity.

The Eastern island empire stands in special relation medically to our own, for it is one of the two countries, Italy being the other, with which complete medical reciprocity has been established, and reference to the foreign section of the Medical Register shows the extent to which advantage has been taken of this mutual concession. During the last few years a number of important scientific announcements have originated from Japanese universities, which are both numerous and well equipped; reminder is scarcely needed in regard to the pioneer work on experimental tar cancer of YAMAGIWA, ICHIKAWA, and TSUTSUI, and the discovery, after much painstaking research, of the spirochæte of infectious jaundice, associated with the names of INADA, IDO, HOKI, KANEKO, and ITO. We have received only this week the first imposing volume of a series of scientific reports from the Government Institute for Infectious Diseases at the Tokio Imperial University, of which Prof. MATARO NAGAYO is director. This work, which has already appeared in the *Japanese Journal of Experimental Medicine*, is now made accessible for the common stock of medical knowledge by the decision of the Institute to publish an account of all research in some European language; and a large part of this admirably printed and illustrated volume is in English. We have yet to learn whether the disaster will be a serious setback to scientific work in Tokio, nor do we yet know to what extent the scientific workers have perished with their universities and institutes, but the motto of those who survive will, we feel sure, be that of Italy after the Calabrian disaster, when Sign. MARCORA quoted, amidst the applause of the Italian deputies, the words "Post fata resurgo." In the present case, should rehabilitation be required, medical and scientific friends in this country will gladly render any aid at their disposal.

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PASTEURISED MILK.

THE prime importance of milk as a food has been emphasised of late by the exponents of what is known as the "newer nutrition," while medical officers of health, on the other hand, have not ceased to put prominently before the public the dangers of a contaminated milk-supply. It is not surprising, therefore, that discussions as to the best policy to adopt for the purpose of obtaining a safe milk-supply have occupied a large part of the time of recent sanitary congresses. At the National Milk Conference held at the Guildhall last year there were doughty protagonists of clean raw milk from tuberculin-tested herds and of adequately pasteurised milk, while perhaps the surprise of the conference was the general endorsement by leading medical authorities of the value of a third form of safe milk, which did not appear on the programme—namely, dried milk. The National Clean Milk Society has convened a further conference at the Guildhall in November next to consider pasteurisation. The appearance is therefore opportune of a report on the Pasteurisation of Milk by Dr. J. M. HAMILL, a medical officer of the Ministry of Health. This report, of which a summary was given in THE LANCET of August 18th (p. 338), puts the case clearly and reasonably for pasteurisation as defined by the new regulations—that is to say, milk which has been exposed once for 30 minutes to a temperature between 145–150° F. (63–66° C.). Milk so treated is rendered reasonably safe as regards the risk of transmitting disease; the pathogenic organisms liable to be found in milk are, with the exception of the tubercle bacillus, killed by the process, and that organism, if not killed, appears to be so attenuated as to become harmless. This appears from the results of an important and laborious investigation by Dr. F. W. CAMPBELL BROWN, printed in the same issue, which may be regarded as settling once for all the thermal death-point of the tubercle bacillus in milk. The difficulty of striking the happy point where sterilisation is sufficient and heat deterioration has not set in is also manifest in the report on condensed milk, which is summarised in another column. In many cases a few spores remain without doing harm.

The effect of pasteurisation on the chemical and physical characters of milk must also be considered. Taste and flavour are scarcely altered. At 145° F. (62·8° C.) the separation of cream is affected but little; at 148° F. (64·4° C.), however, the cream line may be decreased by 40 per cent. This in itself is unimportant; in fact, one of the advantages of homogenised milk is that the cream will not separate. At 145° F. (62·8° C.) the milk proteins are unaltered, but at 150° F. (65·6° C.) 5 per cent. of the albumin is coagulated. There is no evidence that coagulated albumin in pasteurised or dried milk is more difficult to digest, just as there is no reason to suppose that the white of a raw egg is more digestible than the white of a boiled egg. The enzymes are slightly affected, but we do not know if that is a drawback. Junket can be made more easily from pasteurised milk. The soluble calcium and magnesium phosphate are not precipitated. Vitamins A and B are probably not affected; vitamin C is partially destroyed. As the destruction of vitamin C is due to heat and oxidation combined, precautions to exclude air during the process are beneficial. These matters are still under investigation. Transport is still an unsolved problem; distribution even of clean tubercle-free milk gives opportunities for contamination with pathogenic organisms, but if milk is to reach everyone it must often travel long distances and be transportable. Pasteurisation helps to bring this valuable food within reach of town dwellers with its taste, flavour, and nutritive value practically unimpaired. After pasteurisation—and this cannot be too strongly insisted upon—it must be as carefully handled as clean raw milk. Dirty or stale milk if pasteurised will give a higher bacterial count than fresh clean milk pasteurised; nor will it even pay to pasteurise stale milk, as the flavour is not improved thereby.

Pasteurised milk agrees with children as well as raw milk, and the partial loss of vitamin C, whatever it may amount to, can readily be made good by giving orange or other fruit juice. The physical and chemical alterations resulting from pasteurisation are held by some to indicate the possibility of other nutritive changes of which we do not know and which may be important; such hypothetical considerations cannot be allowed to outweigh the important positive advantages accruing from pasteurisation. It seems to be peculiarly difficult to avoid prejudice in this matter of the heat treatment of milk. More than other European countries we have been accustomed to drink our milk raw—east of the Balkans uncurdled milk is not regarded as fit for human food—and the opponents of pasteurisation call in Nature as their witness. Cow's milk, however, is no more a natural food for man than is a hen's egg. Romulus and Remus obtained an unnatural food in a natural manner, sterile and at blood heat. We have to content ourselves with an unnatural food obtained in an unnatural manner and must call in science, not Nature, to our aid. The British farmer is even more afraid of science than the British manufacturer, and it would be a difficult feat for the scientific advisers of the Ministry of Agriculture to persuade the farmers of our western counties to adopt the practice of pasteurisation. The very word stinks of science. It so happens, however, that in these western counties it has been the practice for years to pasteurise such milk as is made into clotted cream or butter and to drink the "scald" milk, without anyone worrying as to whether the nutritive value of the cream, butter, or scald milk were thereby impaired. The old-fashioned Devonshire farmer would, in fact, regard his method of preparing cream and making butter as a "natural" process in strong contrast to the unholy scientific operations of the separator. We need to get rid of prejudice and patiently to apply our knowledge to make available for urbanised populations this valuable food which the forethought of our ancestors has gained for us.

PATHOLOGICAL DEPARTMENTS.

We received lately a copy of the annual report of the pathological department of the University of Leeds which continues its prosperous career under Prof. M. J. Stewart. The staffing of the department has been much improved by the appointment of Dr. J. W. McLeod as first occupant of the chair of bacteriology, due to the munificence of Sir Edward Brotherton, and a considerable step in progress has been taken by the institution of a course in general bacteriology for science and technical students similar to that started in Manchester by Prof. W. W. C. Topley. In this two of the liveliest of our modern universities are leading a substantial and much-needed reform of the state in which bacteriology was a wholly medical subject. But the appointment of Prof. McLeod as city bacteriologist raises other considerations. The diagnostic work of the department in 1922 involved the examination of nearly 18,000 specimens, of which only some 5000 (less than 30 per cent.) came from the General Infirmary, the balance representing public health material, especially from venereal diseases clinics, sent by various bodies, mostly the city of Leeds. The excuse for this utilisation of a department of a university, whose business is teaching and the advancement of learning, is doubtless to be found in the accounts, which show that 41 per cent. of the income of the department is derived from fees for diagnostic work. How far this diversion of the university's activities into money-making channels extends, we do not know, but it is fairly safe to assume that, for example, the department of mathematics is not called upon to earn money by doing actuarial work for insurance companies and commercial firms. But as far as pathological departments are concerned, the practice is unfortunately widely spread through the country. In weakening the ideals of higher education the effect is bad enough. It is also much to be deplored from the point of view of effective and progressive public health administration. The larger hospitals and medical schools have long since realised that they cannot hope to get the best—or, indeed, anything approaching the best—out of laboratory diagnosis unless they have their own laboratories in intimate contact, topographical and personal, with the clinical staff and the patients from whom the materials are derived; sending things down the road and having answers back on pieces of paper is by comparison no use at all. Similarly in public health work the city bacteriologist should be one of the right hands of the medical officer of health, and in continuous and immediate communication with him. Only in this way, we feel sure, can diagnostic bacteriology make its proper contribution to public health administration, and it is surprising that great and enterprising municipalities such as Leeds are content—if they really are content—to go on with a method so imperfect and makeshift. And when they have bacteriological laboratories of their own, professors of pathology will have no need to hold meetings, as described in the Leeds report, to chaffer with the Ministry of Health about the price they are prepared to accept for Wassermanns. As to Manchester the trenchant words of Dr. C. Powell White in our correspondence columns reflect the views at any rate of one section of pathologists on the need for a status independent of outside work.

THE RAPPROCHEMENT OF HOSPITALS AND CONTRIBUTORS.

The year 1922 will be remembered as a year of depression, unemployment, and trade shortage in Sheffield as elsewhere; yet, for the first time for many years, the income of the local voluntary hospitals balanced their expenditure, and the accumulated debt due to the bank was reduced from £116,000 to £87,132. This happy result was achieved mainly by the efforts of the Sheffield Joint Hospitals Council, whose first annual report is of more than local interest. It takes the form of an attractive book of 72 pages, of which tabulated statistics occupy only three, further information being presented with running comment. The right sort of notoriety has evidently been achieved—that which not only stimulates the interest of contributors in their hospitals but also brings them into touch with each other as a corporate body with a common aim. The secretary of the Council has met representatives of some 50 local societies and associations, and during the year there has been formed the Sheffield and District Association of Hospital Contributors, which has rendered valuable service in promoting the growth of the " 1*d.* in the £ " contributory scheme of employers and employees.

This scheme, which is described in a separate " Contributor's Handbook," is essentially an agreement to give, either by means of deductions from wages or directly, a penny for every pound of wages earned weekly to the Joint Hospitals Council. In return for such contributions free treatment and free maintenance is available on admission to any one of the five Sheffield hospitals, though contributors able to pay nursing home fees are requested not to avail themselves of these facilities. The success of the enterprise can hardly lie in this simple appeal alone, but is obviously due to the skill with which it has been organised, and the sympathy shown to the natural desire of the contributor, whether an individual or a firm, to receive some little recognition of his effort to support the hospital and some responsibility for its further maintenance. Such is afforded not only by the opportunity given to Works Hospital Committees to send delegates to the Association of Hospital Contributors, which in turn is adequately represented on the Joint Hospitals Council, but by the classified lists of contributing firms and individual contributors which form the largest part of the first annual report of the Council. The classifications are twofold—geographical, and according to trades—and friendly rivalry may thus be stimulated in at least two directions. Finally, a periodical news-sheet, in poster form, is published. The August issue gives notice of the next quarterly meeting of delegates, announces the programme of a series of free health lectures for the winter session, reports the advent of a new motor ambulance, and gives other information calculated to interest the contributing public.

We have set out the Sheffield plan in some detail because it is obvious that by this or similar means adopted in other industrial areas the voluntary hospital system can be saved. The days, however, when the hospitals could afford to stand detached and coldly solicit help by publication of figures showing huge deficits are gone. A more intimate relation between contributor and hospital boards has come to stay. Criticisms will arise, will be resented, and perhaps quashed, will be repeated, and—dare we say it—improvements in administration will ultimately result. Attention was recently called in our columns [1] to rigid rules in certain hospitals throughout the country limiting the use of the telephone, forbidding the introduction of fruit under any circumstances into the wards, and so forth ; the quality and monotony of the full diet allowed to convalescents might also have been mentioned. It may well be that Associations of Hospital Contributors organised on the lines of the Sheffield and District Association will in the future find important work falling to their hands.

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[1] THE LANCET, 1923, i., 1324.

Annotations.

"Ne quid nimis."

THE PREVENTION OF SIMPLE GOITRE.

THYROID enlargement is not the serious problem in this country that it is in Switzerland and some of the American States. This fact lends special interest to the account of an outbreak of acute goitre in a Lancashire children's home, recorded in our present issue. Dr. E. W. Adams and Dr. H. N. Crossley are not prepared to state whether goitre is or is not unduly prevalent around Rochdale, but they have no doubt that a high degree of thyroid instability is present among the children of the cottage homes in this area. It is hoped that further investigation may throw light on a very puzzling outbreak. It is endemic rather than epidemic goitre that has received most attention in recent times. In America an exhaustive study of the physiology and pathology of the thyroid gland, extending over some ten years, by Dr. David Marine and his collaborators, Drs. C. H. Lenhart, O. P. Kimball, and J. M. Rogoff,[1] has resulted in the development of a prophylactic scheme which deserves careful attention. Not long ago [2] we had occasion to discuss iodine prophylaxis with special reference to the problem in Switzerland, and concluded that the introduction of a small percentage of potassium iodide to the common salt in daily use would be a cheap and useful method. Although the ultimate cause of goitre is totally unknown, its immediate cause is claimed to lie in a lack of iodine, and the American authors support the view which is gaining ground that thyroid hyperplasia is a compensatory reaction arising in the course of a metabolic disturbance and immediately depending on a relative or an absolute deficiency of iodine. The prevention of human goitre on a large scale was begun in Cleveland in 1917, and the method adopted was the administration of 2 g. of sodium iodide in 0·2 g. doses daily for ten consecutive school days distributed over a period of two weeks and repeated each autumn and spring. This amount of iodine is admitted to be excessive, and beyond the ability of the thyroid to utilise and store. One gramme distributed over a longer period would be better ; indeed, 3 to 5 mg. of iodine twice weekly over a period of a month, and repeated twice yearly, would amply suffice. Dr. R. Klinger, of Zurich, instead of sodium iodide, employs an organic iodide which is non-hygroscopic, very stable, practically tasteless—a vegetable fatty acid compound which is combined with chocolate and made into tablets, each containing 5 mg. of iodine. This method has been employed in all the schools in the cantons of St. Gallen, Berne, and Zurich with most striking results—e.g., incidence of goitre among all the school children in the Canton of St. Gallen : January, 1919, 87·6 per cent. ; January, 1922, 13·1 per cent. The possibility of harm from a very small dosage used by the authors is negligible. A mild rash occurred in but 1 per 1000 of the cases treated, and in Switzerland not a single case of rash has been seen, nor has a case of exophthalmic goitre been produced. It comes to this—that if in endemic goitre districts every woman would keep her thyroid saturated with iodine during every pregnancy, she would not develop goitre, nor would there be any tendency toward goitre formation in the thyroid of the child. If every girl would keep her thyroid saturated with iodine during adolescence, that is from the age of 11 to 16 inclusive, none would develop goitre. A large majority of the goitres in boys are congenital, and could be prevented by the administration of iodine to the mother during pregnancy. In young individuals with thyroid enlargement of recent development the curative effects of iodine are very striking, and amount to complete relief. In long-standing goitre neither iodine nor desiccated thyroid are of much value in relieving the deformity. Thus prophylactic treatment is obviously the thing to aim at. As is pointed out in the *Bulletin*, the prevention of goitre is good preventive medicine; it is better preventive surgery.

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[1] The Prevention of Simple Goitre. Compiled and edited by G. N. Stewart. Western Reserve University Bulletin, vol. xxvi., No. 7, July, 1923.

[2] THE LANCET, 1923, i., 660.

PSYCHOPATHOLOGY AND THE PRACTITIONER.

In the *Clinical Journal* of August 22nd Dr. W. H. Maxwell Telling, writing from the standpoint of a consulting physician, discusses the bearing of modern psychology on general practice. After outlining the theories of psychopathology and the scope of its clinical application, he leads up to the striking enunciation that it is the greatest remedial advance of modern medicine; from this arise some important questions. Though others may share in the preventive and educational applications of modern psychology, yet with us should rest its use in curative medicine. But he makes note—though the note is now losing its novelty—that nearly every practitioner faces the public totally unequipped in this most vital branch of medicine, and, as a correlated evil, that one sees young practitioners with an entirely insufficient post-graduate training in ordinary clinical medicine taking up psychopathology and mindful of little else. Dr. Telling's enumeration of the physical symptoms of disease which may have entirely or mainly psychical causes is, as he says, almost beyond credibility till one studies them from the new angle. His practical conclusion is that it does not follow that the treatment of all these cases can be carried out best in general practice, but they can there be sorted out and sent to the real source of cure rather than to the operating theatre, or the electrician, or allowed to drift to the "Christian Scientist" or the quack. The article is a forceful argument for regularising the position of psychopathology so as to ensure that the practitioner shall be enabled to recognise his cases and know which are within his powers of treatment and which are beyond, and, in the other direction, that the would-be psychopathologist shall go through the mill like other aspirants to the ranks of specialism.

SYPHILIS OF THE UTERUS AND ADNEXA.

Dr. Bernard Portis, of the Nelson Morris Memorial Institute for Medical Research, remarks[1] that syphilis of the uterus is a comparatively rare affection, apart from the primary lesion on the cervix, which is the commonest type of syphilitic involvement of the female internal reproductive organs. The frequency of cervical chancres varies according to different observers from 1·5 per cent. (Gellhorn and Ehrenfest) to 8 per cent. (Oppenheim), and 10 per cent. (Ozenne) of all primary lesions of the female genitalia. The paucity of symptoms and rapid repair without scar formation, as well as the fact that comparatively few examinations of the cervix are made in the early stages of syphilis, account for the discrepancy in these figures. According to Ozenne, the anterior lip is involved twice as frequently as the posterior, and in about half the cases both lips are affected. Multiple lesions have often been observed. The cervical chancre may assume either an erosive form or much less frequently an ulcerative form simulating carcinoma. Frank has shown that in the pregnant uterus the lesions may persist up to a period of five months and produce very extensive induration, which may prevent spontaneous delivery of the child. Secondary lesions of the cervix have been divided by Ozenne into erythematous, erosive, hypertrophic, papular, and ulcerative forms, of which the papular is the most frequent. Tertiary lesions of the cervix may assume a gummatous type, in which a diffuse infiltration involves the entire cervix, or a sclerotic type, which may develop on pre-existing primary, secondary, or tertiary lesions. The features common to all syphilitic lesions of the cervix are stated by Gellhorn and Ehrenfest to be as follows: (1) There is little secretion except in the tertiary ulcers or necrotic gummata; (2) there is little pain either spontaneously or resulting from direct trauma; (3) the lesions occur some distance from the external os, which is rarely the case in non-specific ulcers of the cervix; (4) the ulcers are usually covered with a film-like deposit which may be wiped off easily and exhibit a fatty lustre; (5) there is very little, if any, inflammatory reaction. In most of the reported cases of syphilis of the body of the uterus the evidence of the syphilitic nature of the process is inadequate. Primary and secondary syphilis of the body of the uterus has been rarely observed, probably owing to the fact that *Trep. pallidum* shows a predilection for squamous epithelium. Two main types of tertiary syphilis of the body of the uterus have been described by Ozenne: (1) The ulcerating gummatous type, which causes a marked increase in the size of the uterus; (2) the sclerotic type, in which the essential lesions are those of angiosclerosis and fibrosis of the myometrium. Adnexal lesions of which the syphilitic nature has been proven are even rarer than syphilis of the body of the uterus. Special interest therefore attaches to the case described by Dr. Portis, which occurred in a woman aged 38, in whom panhysterectomy was performed in the belief that the condition was carcinomatous. The syphilitic character of the process, however, was proved by histological examination, which showed a chronic diffuse interstitial endometritis, metritis, and perimetritis, with the specific organism in the cellular tissue separating the muscle bundles. The body of the uterus had probably become involved by direct interstitial invasion from a primary lesion on the cervix. Involvement of the adnexa was shown by a corpus luteum and the surrounding stroma of the ovary being the seat of lymphocytic infiltration in which a few treponemata were found.

THE TUBERCULIN DISPENSARY FOR THE POOR.

A combative and stimulating brochure[1] with this heading has recently been issued by Dr. W. Camac Wilkinson, who gives an account of the results obtained by his system of tuberculin treatment. The figures he publishes are instructive, and if certain other figures could be added our knowledge of tuberculin treatment would be not a little enriched. It appears that between 1910 and 1912 there were 107 sputum-positive cases treated at the Lambeth Tuberculin Dispensary. In 1920, 31 of these patients were still alive, 51 had died of tuberculosis and 25 were untraceable. Of the early and moderately advanced cases 68·5 per cent. were still alive, and Dr. Wilkinson compares these figures with those of the London County Medical Officer of Health, according to whom only 28 per cent. survived for four years. It would be interesting to learn whether these 107 sputum-positive patients were selected cases, or if every patient coming to the dispensary was given tuberculin treatment irrespective of the temperature. Again, with regard to the 25 untraceable cases, the question may be raised: Did some of the patients discontinue treatment with tuberculin because they thought it was doing them no good? At the end of his brochure Dr. Wilkinson publishes a short note by Dr. W. Stobie, according to whose statistics 429 cases of pulmonary tuberculosis were treated at Oxford, 83 being given tuberculin and 346 being treated without it. It appears from his table that only 5·2 per cent. of the patients not treated with tuberculin were still alive when this table was compiled, whereas 49·4 per cent. of the patients treated with tuberculin were still alive at the same period. At a casual glance this table suggests that the prognosis is many times better for patients treated with tuberculin than for patients not enjoying this remedy. But Dr. Stobie does not state the principles on which he selected his tuberculin cases. Did every fourth new patient receive tuberculin treatment, the order in which a new patient came to the dispensary being the sole factor determining the selection of controls? Or was the choice of tuberculin treatment determined by the temperature and physical signs? So long as information on these points is withheld, such tuberculin statistics as these are not calculated to impress anyone with more than an elementary knowledge of tuberculosis. Throughout Dr. Wilkinson's brochure there are complaints of the way in which his work has been investigated by the Medical Research Council. This investigation would appear from his account to have been most perfunctory, and if this is the case it is to be hoped that Dr. Wilkinson's work will be given fair judgment after a scrupulous and impartial investigation. He and his assistants have laboured in this particular field for many years, and whether their principles be sound or not, they have, at any rate, made out a case for further inquiries into the action of tuberculin.

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[1] Surgery, Gynecology, and Obstetrics, July, 1923.

[1] London: Nisbet and Co. 1923. Pp 67. 1s.

THE EFFECT OF INDUSTRY UPON HEALTH.

INSURANCE companies in America have discovered that valuable information lies hidden in their records and are setting an example to other countries by instituting investigations and making the results known. One such review[1] deals with life and health among the wage-earning population of the United States and Canada in 1916–1920, including the end of the war period and the great influenza epidemic. The records of five great companies, which were pooled for the purpose, concern some 26,000,000 men, women, and children aged 1 and over—nearly one-quarter of the entire population of the United States and Canada. The mortality experienced is compared with that of the general population of the United States Registration Area; except that the proportion (46 per cent.) of insured persons under age 20 is greater than that (38 per cent.) of the general population, the age-distribution of the two is similar. The only other variant is that the insured population is composed nearly entirely of whites, while the general population contains a coloured element. One criticism—a serious one—must be made of this admirable study; "the statistics are not shown separately for the sexes because not all the companies had their exposures to risk classified on that basis." Since the mortalities of males and females differ so much, only regret can be expressed.

Some of the more interesting results of this great study may be briefly set out here. The total death-rates of industrial policy-holders throughout life exceeded that of the general population, the excess increasing with age; but over the five years reviewed there was a greater fall in mortality among the industrial population, 14·3 per cent. compared with 7 per cent., and in 1920 the mortality was only 6 per cent. above that of the general population. This result, due to decrease in tuberculosis, heart disease, chronic nephritis, and typhoid, is ascribed in part to better wage and living conditions during and immediately after the war. Tuberculosis in the insured group was less prevalent in childhood, but after age 15, particularly in the mid-period of life, was in excess of the general population. A decline (26·6 per cent.), greater than that (20·3 per cent.) for the general population, occurred in the five years, so that the gap between the two mortalities is being closed. An estimate is put forward that tuberculosis causes a loss in life expectancy of 3½ years for males and 2½ for women, or about 3 years for the two combined, and, further, that a year of life is worth $100 (£20 8*s.* 4*d.*) in net addition to national wealth. Hence tuberculosis is represented to cause a loss of half a billion dollars in the United States; on the same basis of calculation the economic loss in this country would be about £245,000,000 a year. The effect of the influenza epidemic of 1918 is of great interest; it is estimated quite fairly by taking influenza and pneumonia together as one mortality group. The age-distribution of the epidemic was entirely different from the normal for this mortality group which concerns early childhood, then passes at a low level through adolescence and adult life until it increases progressively in late middle life to old age. The great epidemic fastened upon ages 25–34, with ages 20–24 second and ages 35–44 third; upon childhood its inroad was comparatively moderate; in old age normal rates prevailed. This peculiarity is reminiscent of a similar, although less sudden, change in the age-distribution of phthisis during the war period which was manifested in different countries in proportion to their food needs. Probably the two diseases were manifesting a change in resisting power due to food shortage, which by 1918 was affecting even America. The better circumstanced policy-holders suffered least; the group of lives insured on intermediate plans showed a higher mortality; and the group insured on weekly premium plans had the highest rates. The heavier epidemic damage probably arose out of economic and social disabilities. When an alteration in age-distribution occurs, phthisis records teach that the normal is not readily regained, and the influenza-pneumonia records in 1919 and 1920 continue to exhibit a peak in mortality at ages 25–34.

The report rightly dwells upon the importance of organic heart disease, which affected the insured persons more than the general population to about the same extent as tuberculosis; but whereas the excess for tuberculosis is at its height at ages 35–44, that for heart disease has a crest at ages 15–19, which suggests an occupational influence for the former rather than the latter. Mortalities both for chronic nephritis and for cirrhosis of the liver were higher for insured persons, and the excess in each case was greatest at ages 35–44; both showed a great decline, that for nephritis 26 per cent. and that for cirrhosis 57·7 per cent., as compared with 20·7 per cent. and 45·6 per cent. for the general population; the downward trend for cirrhosis is ascribed to diminished use of alcoholic liquors and is regarded as evidence of the effects of prohibition. Typhoid fever, the best gauge of the progress of sanitation, was less prevalent among insured persons, and declined more (49·1 per cent.) than among the general population (42·6 per cent.). The report deals intensively with accidents, animadverting on the increase of automobile traumatism; and with puerperal mortality, wherein the data indicate that the recent rise is attributable entirely to accidents of pregnancy and "other accidents of labour," while puerperal septicæmia and intoxications of pregnancy have remained constant. These are all matters on which British insurance companies could, if they would, give comparable information.

PASSIVE HYPERÆMIA IN THE TREATMENT OF CHOREA.

BIER, when introducing his treatment by passive hyperæmia, laid most stress on his own realms—namely, on surgical conditions—but he also suggested that the treatment might be applicable to cerebral conditions such as epilepsy, chorea, and certain forms of headache, and reported a few observations made in this direction.[1] Since then there appear to have been few, if any, further attempts to utilise his treatment in the cerebral region. Dr. Esau[2] has, however, been using it in the treatment of chorea in his practice in the Krankenhaus Oschersleben-Bode, and reports excellent results. The treatment consists in applying a rubber band round the neck in such a manner as to produce slight congestion of the head, at first for a few hours several times a day, and later when the patient has become accustomed to it, for 22 hours at a stretch. The only unpleasant symptoms arise from the local pressure, and these can easily be overcome by padding the band and by the application of alcohol to the skin. While this treatment was in progress Dr. Esau gave no drugs, nor did he keep the patient isolated, with the exception that in very severe cases he placed the child in an adult rather than in the children's ward. He found that chronic cases responded more rapidly than acute in their first attack. Six cases were treated, one of whom was a girl aged 13, who had suffered from chorea for the last seven years, each attack commencing in December and lasting till the following April. During the attacks every form of medical treatment had been tried, including long spells of isolation in bed, but without result. The child lost weight each time, and only slowly recovered during the summer months. On Jan. 29th, 1923, she was admitted to hospital for an acute attack of appendicitis. She was also suffering from chorea, which had been present since the beginning of December. Operation was successfully performed for the appendicitis, but had no influence on the chorea, which was very severe, and interfered with speech and with feeding. Three days after admission passive hyperæmia was commenced. On Feb. 10th the child lay quietly unless she was disturbed, when active movements of all the limbs took place. By Feb. 26th all choreic movements had disappeared and she was discharged. She was seen again on April 24th, when the general condition was excellent, the parents stating that she was better than she had ever been before. All inclination to whine and cry, which had always been present previously, had entirely disappeared. This case was cured in four weeks, when in former attacks it had taken four to five months. Another child had had two recurrent attacks, and when admitted had been ill for seven weeks, the movements throwing her out of bed, and making walking and speaking impossible. After 12 days' treatment she was able to stand and walk slowly, and in 26 days she was discharged cured. When seen again three months later she was in excellent health, and there had been no recurrence. The other four cases were equally severe and responded as quickly.

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[1] The Mortality Experience of Industrial Policy Holders, 1916–1920. Published by the Industrial Life Insurance Companies of America. New York. 1923. Pp. 150.

[1] Grenzgeb. d. Med. u. Chir., vii., parts 2 and 3.

[2] Münchner med. Wochenschrift, June 22nd, 1923.

Dr. Esau also carried out a series of observations as to the effect of passive hyperæmia of the head on the general blood pressure. He found that the tendency was for the pressure to rise at the beginning of the congestion, but shortly afterwards to sink to the normal or even below it, but the results were far from constant, and it was difficult to distinguish between changes that were due to the congestion and those that occur normally without it. In some cases the blood pressure sank after removal of the constriction, but rose again shortly after—e.g., B.P. 117 mm. Hg during congestion, 109–105 after discontinuance, and 110–112 a few minutes later, but again these results were not constant, even with the same individual, and further observations on a large scale are necessary to confirm them. The pulse-rate was not affected by the congestion, demonstrating that the intracranial pressure never rose anywhere near that occurring in cerebral hæmorrhage or in meningitis.

PRIMARY CARCINOMA OF THE URETER.

In a report of a case of primary carcinoma of the ureter, with a review of the literature, Dr. Louise H. Meeker and Dr. Joseph F. McCarthy,[1] of the department of pathology and bacteriology and the department of urology of the New York Post-Graduate School and Hospital, illustrate the rarity of this condition, which was first described in 1879, by stating that of the 33 recorded cases in only five was a correct diagnosis made before operation or death; 19 of the cases were in males and 14 in females. The youngest was aged 15 and the oldest 89. Death occurred in 14 instances before operation, some of which were inoperable, and after operation in 11; eight recovered after operation, and two of these reported that they were in good health a year after the operation. As regards the symptoms, the pain is of a relatively atypical nature. In only a small minority was it of the radiating type so frequently encountered in ureteral calculus. It was frequently referred to the lower abdomen, back, sacral and iliac regions, occasionally passing down the leg of the side affected, and was continuous instead of being intermittent as in calculus. On examination of the abdomen a tumour was found in 14 cases and on cystoscopic examination in six cases. In only four cases was pus found in the urine, the absence of pus in the other cases being probably due to the obstructive nature of the ureteral lesion, as hydronephrosis or pyonephrosis is frequently present. In seven instances the discovery of epithelial cells in the urine aided the diagnosis, but the writers point out that it is necessary to make frequent examinations of the urine for atypical cells, especially after attempts at ureteral catheterisation. The occurrence of hæmorrhage on ureteral catheterisation when calculus cannot be demonstrated is also of considerable significance. Chevassu and Mock, who claim to have made the first preoperative diagnosis of primary carcinoma of the ureter, were able to produce bleeding at will, as were also Chiari and Suter. When the ureteral catheter passes the obstruction functional tests frequently reveal renal impairment. A ureteropyelogram is of the greatest value when the obstruction is passed, but if the growth prevents the passage of a ureteral catheter the return of the fluid renders the method useless. The following operations have been performed for the condition: transvesical cauterisation, nephrotomy, resection of ureter and reimplantation twice, with recovery in both cases, nephrectomy with or without ureterectomy, ureterectomy and later nephrectomy, and primary nephro-ureterectomy. The case recorded by the writers was in a man aged 49, who complained of pain in the right hip radiating to the right inguinal and sacro-pelvic regions without any urinary symptoms. Physical examination three weeks before death showed pronounced abdominal tenderness and a cord-like mass in the right hypogastrium. There were marked emaciation and cachexia. The diagnosis was inoperable malignant disease of the colon or ureter. Death took place after six months' illness, and the autopsy revealed a tumour of the right ureter extending from the bladder to the renal pelvis and metastases in the liver, pericardium, lungs, spleen, pancreas, right kidney, lymph glands, and skin. There was right hydronephrosis. Microscopical examination indicated that the tumour had developed from the epithelium lining the ureter.

VENEREAL DISEASES IN NEW SOUTH WALES.

The first report of the Commissioner under the Venereal Diseases Act, 1918, is published as a section of the Report of the Director-General of Public Health to the Minister of Public Health of New South Wales. The Commissioner is Dr. Robert T. Paton, who retired from the position of Director-General on April 30th, 1921, on attaining the statutory age-limit. The period covered by the report is from Dec. 1st, 1920, when the Act came into operation, to Dec. 31st, 1921. The Act aims at ensuring that all cases of venereal disease will have immediate and continuous treatment and requires notification of all cases. A sufferer must place himself under treatment within three days of becoming aware that he is suffering. The Commissioner reports that the provisions have been applied with very satisfactory results, as the following figures show:—

Patients reported for failure to continue treatment ..	2472
Letters returned unclaimed	1286
Number of patients who resumed treatment ..	906
Cases not yet finalised	280

Certain difficulties in working the Act have arisen. Patients changing from one medical practitioner to another have failed to notify the first medical attendant. Patients have given another person's name and address and this other person has naturally resented the receipt of the warning notice. Nevertheless the fact that through the first year's working of the Act 906 persons have returned to treatment is a great gain. The Government provides free treatment at subsidised hospitals and, of 9405 cases notified in 1921, 4477 were notified by metropolitan hospitals. The clinic accommodation has been increased and still further increase is necessary at Sydney and Newcastle. Some of the country hospitals try to send their cases to the metropolis, but Dr. Paton is strongly of opinion that every country hospital should make provision for the treatment of venereal cases. Special drugs and instruments are supplied free to country hospitals and all necessary biological examinations are carried out free at the Government laboratory. The provisions of the Act have stopped the advertisements of quacks and of so-called remedies. Posters and pamphlets are distributed, and Dr. Paton favours "the launching of a broad educative propaganda." He is also in cordial agreement with the resolutions passed by a conference of Commonwealth and States medical officers in Melbourne on Feb. 3rd, 1922, in favour of the establishment of prophylactic depôts as widely in the community as possible and of immediate self-disinfection as a useful auxiliary to the work of such depôts. Dr. Paton recommends a beginning by the establishment of two ablution depôts in Sydney, where information as to self-disinfection should be made available to any person desiring such information. The result of the second year's working of this Act in New South Wales will be awaited with interest.

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[1] Journal of the American Medical Association, July 14th, 1923.

THE LATE DR. E. K. MUSPRATT.

THE death, in his Grecian house at Liverpool, of Edmund Knowles Muspratt, in his ninetieth year, removes one of the pioneers of applied chemistry. His father, who actually founded the Lancashire alkali industry, sent his youngest son, Edmund, to study at Giessen, where he was attracted by the fame of Liebig, under whose influence he came. The story is told that he witnessed in Liebig's own household at Munich the first application of meat extract to sustain flagging energy in severe illness. Returning to Liverpool, Muspratt threw his immense energy into the heavy chemical industry, and took a large share in bringing it to the prosperous position which it now occupies. He managed for his father the chemical works at Liverpool and at Widnes, which later became incorporated as the United Alkali Works. Muspratt's knowledge of metallurgy was acquired in the cellar at Quay-street, Manchester, which did duty as a laboratory in Owens College, and after his success he donated £17,000 to the University of Liverpool to found the first completely equipped laboratory for the study of physical and electro-chemistry in the British Empire. It was owing principally to his efforts that the scheme took shape to bring to Liverpool water from Lake Vyrnwy, and Muspratt took a large share in the foundation of University College, now the University of Liverpool, which elected him as the first President of Council and as Pro-Chancellor from 1903 to 1909. His high acumen in adapting chemical knowledge to industrial processes was accompanied by unusual appreciation of literature and art, and he was besides a keen and observant traveller in Europe and America. Liverpool has lost in Dr. Muspratt one of her greatest citizens.

SOME CARRIER PROBLEMS.

THE county medical officer of health for Aberdeenshire, in presenting his annual report for 1922, emphasises the danger and expense of diphtheria epidemics, and the most successful method of stamping out the disease. Two epidemics occurred within recent years, one in 1913–14, and the other in 1920–21; expenses in the district hospitals alone in the latter epidemic amounted to £22,000. The number of cases of diphtheria last year was 125, compared with 321 in 1921 and 374 in 1920. Dr. J. P. Watt lays great stress on treatment by the immunisation method with toxin-antitoxin and the Schick test. It was of the utmost importance to stamp out infection in diphtheria carriers, for there was one carrier for every 100 adults and four or five for every 100 children. Much valuable work had been done recently by the Health and Education Departments in New York. Free inoculation with toxin-antitoxin had been given in all the New York schools with most successful results. The report also deals with the treatment of chronic typhoid carriers with detoxicated vaccines. It is well established that epidemics of typhoid fever may originate from a carrier, the typhoid bacilli surviving in the walls of the gall-bladder and kidneys. Such an infection has been found extremely difficult to eradicate. Cholecystectomy is not uniformly successful in bringing about a cure. In view of the successful treatment of chronic nasal diphtheria carriers at Summerfield Hospital with detoxicated diphtheria vaccine, Dr. Watt determined to treat chronic typhoid carriers with a course of detoxicated typhoid vaccine. To one carrier of 20 years' duration injections were given subcutaneously every fifth day; at the end of three months typhoid bacilli were still present; at the end of six months an atypical bacillus, which did not agglutinate. After a second course of treatment by injection and also orally, this bacillus disappeared and all samples were negative. Dr. Watt hesitates to draw conclusions as yet from such treatment, as typhoid carriers may be "negative" for considerable periods. Many samples must be examined over an extended time before a definite cure can be claimed. But his observation is suggestive.

PRURITUS OF THE ANAL REGION.

A NICE distinction in nomenclature is suggested by Dr. J. F. Montague, who classifies[1] under the two headings of Direct and Indirect all types of pruritus of the anal region; he reserves the term Pruritus Ani for direct cases—i.e., those in which there is a local irritant such as a fissure—and styles the indirect cases anal pruritus. He explains all cases of indirect pruritus—i.e., those which occur in the absence of any local lesion or irritant—as due to the transference of an irritable stimulus from visceral afferent nerves to somatic nerves with a consequent misrepresentation or error in localisation of the resultant sensation, and gives the following anatomical explanation. The pruritic zone is supplied by sensory nerves from the first four sacral nerves, which are in intimate neural connexion with the pelvic and other abdominal viscera, through the aortic and hypogastric plexuses and when a viscus is the seat of chronic inflammation, congestion, and hypertrophy the mechanical tension sets up efferent stimuli which the spinal cord misunderstands. He points out that indirect pruritus is not relieved by local anæsthesia, as is the case with the direct type, but, unfortunately, the indirect soon has the direct grafted on it when the patient has developed the scratching habit. The pathology of pruritus is in the main so obscure that we welcome any attempt at its elucidation.

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[1] The Etiology and Pathogenesis of Anal Pruritus and Pruritus Ani, Transactions of the American Proctologic Society, 1922.

THE Medical Branch of the Board of Education has been transferred to 54, Victoria-street, London, S.W. 1. The telegraphic address is "Meducation Sowest, London."

MEDICAL REPRESENTATION IN THE NEW DAIL.—The elections in Ireland have resulted in the return of a larger number of medical men than sat in any previous Dail. Of those who were members of the last Dail, two—Dr. P. McCartan, who did not seek re-election, and Dr. V. White, who was unsuccessful—are absent. Among the independent members Sir James Craig, F.R.C.P.I., and Dr. Myles Keogh, retain their seats, as does also Dr. R. Hayes, of the Government Party. The Republican, or Sinn Fein, party contains no less than five medical practitioners—Drs. J. Crowley, P. McCarville, O'Byrne, J. Ryan, and Kathleen Lynn. The last-named is the first woman doctor elected to any Parliament in the British Islands. It is not yet known whether the members of the Sinn Fein party will take their seats, and therefore one cannot foretell what effect on health policy the presence of so many doctors in that party may have.

Modern Technique in Treatment.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

XXXV.

THE TREATMENT OF ENURESIS.

There is none of the minor ailments of children which has so marked an effect on the moral and mental well-being of a child, and in later years on his material prospects, as the habit of nocturnal incontinence of urine. It is a troublesome complaint both to the parents, the patient, and to the doctor who is called upon to treat it. Although from time to time the virtues of some chosen therapy are proclaimed, consideration of the physiological aspect of micturition makes it obvious that there can be no one method or drug which can be relied upon to improve the trouble. In the infant the evacuation of the bladder is purely a reflex act. Almost any conceivable stimulus is sufficient to excite the centres in the spinal cord which control the act of micturition, with the result that the bladder contracts and evacuates its contents completely. During the first year of life this is the normal condition, and it is frequently prolonged into the second year. A careful nurse can, however, often train her charge in such a way that by the end of the fifteenth month the spontaneous evacuation of the bladder is a comparatively rare event; and except for accidents or illness incontinence is uncommon after the end of the second year. The training which will accomplish this result is, of course, largely attention to the proper evacuation of the bladder at regular intervals. If after the age of 2 years enuresis or precipitate micturition during the day is present it must be considered as no longer a physiological but a pathological phenomenon.

Enuresis in young children is usually dependent on a reflex contraction of the bladder, but exceptionally the symptoms suggest an overflow incontinence; the child is said to "drip like a tap." It is probably this type which has led some observers to talk about the failure or absence of the sphincter, and to suggest various kinds of local treatment based on this supposition. In fact, in those cases of this type which I have seen I do not think that there has been any reason to suppose such a failure; they regained control with ordinary treatment quite as rapidly as the more usual type. Another condition which is much more difficult to treat successfully occurs in the children at or even after puberty, in whom incontinence has existed for some years. In them the bladder appears to have reached a condition of extreme local irritability, which makes it impossible for the urine to be retained for more than a few minutes at a time. Such unfortunates have almost reached the same state as the child who is afflicted with extroversion of the bladder. My experience, however, is that even with these patients something can be done. These cases of "dripping like a tap" and of "vesical spasm" are not the common type. The majority belong to the "reflex contraction" group. These patients nearly always, besides the nocturnal enuresis, have precipitate micturition during the day, and it is that symptom which must be first tackled.

There are two groups into which the children who are brought with enuresis can be divided. The group (A) which is congenital—that is, in which the normal control which should come by the end of the second year has never been attained; and the group (B) which has an acquired condition—that is, in which the normal control has been gained and subsequently lost.

The Congenital Group.

In the first group will be placed the children who suffer from congenital defects, whether physical—for example, extroversion—or mental. It is obvious that very little can be done for them. It will also include the children who suffer from minor epilepsy; who, perhaps, have never had a fit, but whose history, when carefully and fully considered, contains suspicious details. One such suspicious fact is the intermittence of the enuresis. The child will go for some considerable time without enuresis, and then have a series of accidents within a week or two, after which he will again be untroubled. If with such symptoms there is a story of inattention, or giddiness, or attacks of dazedness the probability of epilepsy being the cause is enhanced, and in such instances the use of bromides in small doses is, as a rule, effective. When these cases are exhausted there are still left a considerable number in whom there is no obvious reason for the continuance of the incontinence; they are cases of so-called "essential enuresis."

Acquired Enuresis.

The same will be found true of the second group of acquired enuresis. In some few of such cases it is possible to discover an obvious exciting cause. For example, in some of the older school-girls there is a chronic intermittent *B. coli* pyelitis and cystitis, the treatment of which will stop the enuresis. In others there is some traumatic cause—for example, the presence of a stone in the urinary tract (incontinence may be the only symptom of its presence); in rare instances there may be tuberculosis of the tract, or a reflex excitability may have been established by the existence of a balanitis or a vulvitis. But in the majority there is no obvious cause; they are cases of "essential enuresis."

Essential Enuresis.

Essential enuresis is the persistence of, or return to, the reflex condition of the infant; and though the removal of some of the more obvious exciting stimuli may in some lucky cases effect a dramatic cure such a result is not very common. Often the removal of adenoids has been held out as certain to stop the urinary trouble, which all the same persists; the presence of worms in the large intestine has been held responsible, but their effective treatment has not removed the enuresis. Dietary treatment has been given without good effect. All these things are part of any effective treatment, but nothing in my judgment can replace the re-education of the child just as if he or she were a baby in the second year. The education must begin by teaching the child to control the bladder during the day. If the water can be retained for a period of two hours only, then every two hours the bladder must be properly emptied. After a few days, when the excitability is lessened, the period can be lengthened to three hours, and it must be forbidden to the child to perform the act at any other than the stated time. This is a prescription which sounds more difficult to carry out than it is found to be in practice. The interval is then lengthened to four and five hours, and then lastly to three times in the 24 hours. By the time that the child has learnt to control micturition during the day to this extent the nocturnal enuresis will, as a general rule, also have disappeared, but its disappearance can be helped by some simultaneous attention to this part of the trouble. It will be found on careful inquiry that most of the children who wet the bed do so in the first two hours of sleep. If they are wakened at the end of an hour and made to empty their bladder it often happens that the rest of the night will be dry. It is not always so, and it may be necessary for a short time to waken them every three hours, but with the increasing control during the day the nocturnal symptoms become less severe.

This method of training in a nursing home or a hospital is generally successful in a short time, a month or even less, but too often there is a relapse because the punctuality of an institution is not observed at home. However rapid and complete the apparent success, the method of training should be persisted in for at least six months.

Training is, I think, the one essential without which all else is likely to be useless, but there are various adjuvants. There should be no attempt to restrict the intake of fluids, a step which leads to the secretion of a highly concentrated urine, likely to be exciting to the bladder—in fact, I think it is advantageous to promote diuresis by the administration of potassium citrate. There are also some other drugs which I have occasionally believed to be beneficial. The first of these is strychnine given as liq. strychninæ in doses which are large for the age of the child; I should, for example, give ♏ v.–vii. three times a day to a child of 6 years, for a week at a time. The second is thyroid, which I like to give to those children who are lethargic and inactive; the bright, energetic, excitable child is better without it. I use doses of gr. 1–3 twice a day. The third drug is belladonna, a time-honoured remedy, usually given in too small doses; to be efficacious it requires to be given in such doses as will produce a physiological effect, either in complaints of dryness of the mouth and throat or in loss of accommodation. Children vary much in their tolerance of this drug, and the proper dose must be ascertained for each case. It is safe to begin with a dose of ♏ x. of tinct. bellad. three times a day, increasing this rapidly till the physiological effect is obtained. Another drug which I have occasionally found useful is potass. chlorate. Why it should have any effect I cannot tell, but I have satisfied myself that it is of benefit in some cases. I have used many other drugs and failed to find any of value, though iron and arsenic are, of course, useful where there is a need of tonics. As regards diet, I think there is profit in a prohibition of sweets, and also in reducing, if need be, either the starchy or the nitrogenous parts of the meals—that is, in stopping over-feeding.

With such methods I think the prospect of success is good in about 75 per cent. of the cases of essential enuresis within a period of six months. Of the remaining 25 per cent. the majority can be cured by persistence in treatment over longer periods up to two years, but there is a small percentage in which the condition continues, apparently without appreciable improvement, up to puberty. In a very few cases, chiefly in girls, it may persist into adult life. Electrical treatment has proved disappointing in my hands, whatever the method adopted, and the same is true, so far as my own small experience goes, of any form of psychotherapy.

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Special Articles.

BACTERIOLOGY OF CONDENSED MILKS.

A REPORT[1] TO THE FOOD INVESTIGATION BOARD.

THIS long report, of 103 octavo pages, deals with both varieties of condensed milk, but the two reports are quite distinct and the scientific problems in the two cases are very different. Both are essentially bacteriological studies, and methods of manufacture, chemical composition, &c., are only briefly discussed in so far as they are required to make the bacteriological findings intelligible.

SWEETENED CONDENSED MILK.

All the samples examined were of the full cream variety. A short study is given of the methods of inspection adopted at the ports of entry on lines similar to those given in previous reports on canned meat and marine products. With blown samples no difficulties were met with, but the judgment of the inspectors as regards springy and otherwise defective tins was only correct in about half the cases. These tins are not, however, of great importance, since the majority of rejects are due to gaseous decomposition.

The bacteriological studies are based upon a detailed examination of 95 samples of which 33 were "blown" rejected tins, 13 rejected for other physical conditions, 15 sound shop tins, and 34 sound factory tins, the latter being tins obtained direct from condensed milk factories passed as sound, the exact date of manufacture being known. In addition, 32 samples of sugars, fresh milk used for condensing, air samples, or deposits from pipes in the factories were examined. A large number of experimental tin inoculation experiments were also carried out.

Organisms Isolated and Their Significance.

Sweetened condensed milk is never sterile and the distribution of yeasts, micrococci, anaerobes, gas-producing aerobic bacilli, sporing aerobic bacilli, and thermophilic bacteria are separately considered. The report shows that the relative importance of these groups are very different. Apart from the possible presence of tubercle bacilli and perhaps some types of streptococci, none are of pathogenic significance. Micrococci were present in every sample of sweetened condensed milk as streptococci, staphylococci, and diplococci. They are in part survivals from the original milk in part gaining access during manipulation after condensation. Anaerobes, on the other hand, were only found in 2 out of 76 tins. While both were from infected tins direct experiment showed they were not a cause of unsoundness. The physical changes consequent upon condensation makes the milk an unsuitable medium for their growth. Gas-forming aerobic bacilli were isolated from 7 tins, or 9·3 per cent., of the samples examined. All were *B. coli* strains almost identical, all fermenting both lactose and saccharose, and so potential causes of the blowing of tins, particularly as they grow well anaerobically. Numerous experiments, including direct inoculation of tins, showed that while their growth is not inhibited by 40 or even 50 per cent. of saccharose they will not grow and ultimately die out in condensed milk. Either from its viscid nature or from some other cause it is a medium unfavourable to their growth and viability. These results were in accordance with the distribution of the organisms in the samples and suggest that this type is not a cause of unsoundness in this food product.

Considerable interest attaches to the group of sporing aerobic bacilli, since they were isolated from 92 per cent. of the tins, while the authors consider they are probably present in every sample. In view of their ability to decompose milk and proteins generally, they are potential causes of decomposition. On the other hand, their wide distribution in tins, sound and unsound alike, suggests that they do not, in fact, do so, and this was confirmed by a number of direct experiments. These showed that their harmlessness was not due to the anaerobic conditions to any material extent and only very partially to the high percentage of saccharose, but must be ascribed to the colloidal changes in the milk produced as a result of condensation. Under the three conditions combined they are incapable of producing any decomposition or proteolytic changes in the milk. Thermophilic bacteria, all of sporing type, were isolated from 76 per cent. of the samples examined and were found to be of no significance as a cause of decomposition. They are probably survivals from the original milk.

Yeasts.

On account of their great importance special attention was given to this group of organisms, and over 22 pages are devoted to a detailed study of their presence, distribution, and significance in this type of condensed milk. Yeasts were present in 91 per cent. of the "blown" tins examined, and this condition is almost invariably due to the growth and chemical activities of yeasts. The problem, however, is not the simple one of unsoundness being due to their presence alone since yeasts, including many fermenting yeasts, were isolated from many sound factory samples and were shown not to originate decomposition changes. The yeasts isolated were grouped under seven different types, the chief points of importance being their fermenting properties as regards saccharose and lactose and their ability to grow in 40 and 50 per cent. saccharose solutions. That fermenting yeasts under suitable conditions can cause tins to become blown was amply demonstrated by numerous direct experiments in which sound tins were inoculated. A long series of experiments, using special forms of apparatus, enabled a coherent and practical explanation to be given of the prevalence of even fermenting types of yeasts in sound samples of condensed milk. Living yeasts may be widely distributed in condensed milk even when manufactured under modern and scientific conditions. Yeasts do not readily multiply in such milk. This is not due to the high percentage of saccharose, is in part due to the fact that condensed milk is a medium not very suitable for their growth, but is chiefly because of the restricted supply of oxygen. "In tins of condensed milk the supply of oxygen available is very limited and is soon exhausted. If the yeasts are present in sufficient numbers, or if they can multiply sufficiently with the little oxygen available, then they will be able to produce sufficient enzyme to break down the saccharose and produce gas. They are then comparatively independent of any oxygen supply and need not go on increasing materially in numbers, but their enzymes can steadily produce gas." If only a few fermenting yeasts gain access they are unlikely to produce gas and cause the tin to become blown, because they will not increase sufficiently before anaerobic conditions become established in the tin, thus causing their multiplication to cease. Under such conditions they gradually die out. These facts are of great practical importance in connexion with the prevention of unsoundness and suggest many points of importance in manufacture.

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[1] Studies in Sweetened and Unsweetened (Evaporated) Condensed Milk. By William G. Savage, M.D., B.Sc., and R. F. Hunwicke, B.Sc., A.I.C. Department of Scientific and Industrial Research. Food Investigation Board. Special Report No. 13. H.M. Stationery Office. 4s.

A study of their source showed their invariable presence in the air of the condensing factories, and this and their survival in the milk used, due to insufficient preliminary heating, must be regarded as their main sources. An important source keeping up their supply is from deposits in the pipes leading from the vacuum pans, as after the milk has been pasteurised it is never again subjected to temperatures high enough to secure the destruction of yeasts.

Changes on Keeping.

A long series of observations were made upon changes in bacterial content, acidity, colour, and consistency under different conditions. The average number of organisms per gramme was usually low in fresh samples and fairly uniform considering the consistency of the material. When tins were kept *unopened* at 21° C. and 37° C. there was usually a diminution rather than an increase in the number of organisms, but when a small amount of sterile air was admitted the number of organisms showed a marked increase for the first two weeks or so, followed by a diminution, so that at the end of about three months the numbers were often less than at the start.

No facts of special interest were elicited as regards acidity and H-ion concentration changes with time. The darkening in colour was not associated with bacterial activity, and is probably due to caramelisation of some of the sugar. It took place much more rapidly at higher temperatures. The thickening and increased viscosity which takes place with time showed no relationship to changes of acidity or bacterial activity and were colloidal in character.

Practical Considerations.

There is no suggestion that the bacteria and yeasts which are present and which are the subject of detailed study are harmful to the consumer, and the report is mainly of interest as a detailed study of the causes of unsoundness and the prevention of wastage and food loss. Compared with new cow's milk condensed milk is a food of very low bacterial content. The report does, however, supply much scientific information into the causes of condensed milk decomposition and how to prevent such deterioration. The practical points indicated as of the greatest importance are the necessity to ensure the destruction of yeasts in milk before condensation, cooling the milk under conditions which avoid air contamination, the use for the condensed liquid of suitable right-angle pipes taken apart and sterilised every day, canning of the milk as soon as possible after condensing, and in particular the use of airtight containers.

Unsweetened Condensed Milk.

For this food it is pointed out that correct condensation offers many difficulties, and the margin between success and failure is probably a narrower one than for any other type of canned food. A brief account of methods of manufacture is given. The bacteriological studies are based upon the examination of 104 different samples—rejected, shop, and sound factory samples. This type of condensed milk showed a much higher proportion of sterile tins, the actual percentages being 85 for the shop and 76 for the factory tins. The organisms found were most commonly sporing aerobic bacilli, but also micrococci and one yeast. No physical alterations were noted in the contents.

Of the 60 rejected tins 47 showed definite abnormalities in the contents. It is of interest to note that the causes of the unsoundness were very different from those found with the sweetened variety. Yeasts were unimportant and only a cause of unsoundness in one sample. Sporing anaerobes accounted for 3, micrococci for 18, gas-producing aerobic bacilli of *B. coli* and *B. cloacæ* type for 6, and a special type described as "coccoidal bacillus" type for 5. The cause of decomposition was not ascertained in the remaining tins and 7 of them were sterile. The experiments carried out do not support the possibility that chemical changes are ever a cause of a blown condition. The suggestion that micrococci may not only cause decomposition changes in the contents but even the development of gas is a new conception, but is supported by a number of experiments in which it is shown that under special conditions the micrococci selected did produce gas from unsweetened condensed milk. The gas produced was carbon dioxide and the blown condition could not therefore be ascribed to hydrogen developed from the chemical action of the milk on the tin retainer.

The coccoidal bacilli constitute a new type which show marked pleomorphism. The authors mention that they have found it rather prevalent in unsound canned fruit as a cause of unsoundness.

Practical Considerations.

The conditions which may produce unsoundness are complex and not merely a question of the presence or absence of certain types of bacteria, since there are some types which at one time are inert while at others they make the food unsound. The changes in the condition of the milk as a result of its concentration are profound and not merely those caused by a deprivation of much of the water. The milk so altered is in general less suitable for bacterial multiplication. The manufacturer has many difficult problems to contend with, and very slight differences in the temperature of sterilisation and slight changes in acidity may yield a coagulated useless product. It is doubtful whether the temperatures of processing which can be adopted without risk of damaging the product are capable of always ensuring a sterile product. Probably in many cases a few spores are left undestroyed. The results of the authors show, however, that decomposition is nearly always due to non-sporing bacilli, and that what the manufacturer has to guard against are the survival of non-sporing bacilli (especially the more resistant types of micrococci) and the admission of air through minute leaks which may enable dormant forms to multiply and cause decomposition changes.

ARSENICAL POISONING.

THE WORK OF THE SWEDISH COMMISSION.

SOME years ago the Swedish medical profession and, to a certain extent, the lay public were much exercised over the part played by arsenic in wallpaper, clothing, and domestic articles, and the discussion of this subject led to the appointment by the Swedish Government of a Commission composed of chemists and doctors. Prof. K. Petrén, of Lund, presided over this Commission and was in special charge of the clinical side of the investigations. These were not merely concerned with sifting evidence already available; new and important researches were undertaken, and some of them have thrown valuable light on the problems of arsenical poisoning. In a recent communication published in French, Prof. Petrén[1] has given a summary of the most instructive findings of the Commission. Simultaneously a 240-page monograph has been published in German by his collaborator, Dr. L. Brahme,[2] whose researches deal with the presence of arsenic in the blood and cerebrospinal fluid. Another investigator, Dr. Bang, who has recently died, carried out systematic examinations for arsenic in the urine of healthy persons. His work was published in 1919 in Swedish,[3] and a short summary is given of it in Prof. Petrén's paper.

House Poisoning with Arsenic in Sweden.

The term "house poisoning" covers poisoning by arsenic from such sources as wallpaper, clothing, articles of furniture, stuffed birds, and the like. Inquiries addressed by the Commission to Swedish practitioners as to the occurrence of cases of house poisoning elicited records of 91 cases, but when these came to be scrutinised very few were found to be proven. The same observation was made when the literature of the subject was sifted, and it was found necessary to fix certain standards and criteria by which the genuineness of cases of arsenical poisoning of this class could be judged. For arsenical house poisoning to be diagnosed it must, among other things, be proven that the symptoms began within one to three months of exposure, and ceased within three months of the cessation of such exposure to house poisoning. In this connexion it is not conclusive evidence of house poisoning that a patient loses his or her symptoms after leaving a room in which arsenic has been found, for there may have been other morbid influences at work in this particular room.

The Literature of House Poisoning.

Prof. Petrén's excursions into the literature of the subject revealed the curious fact that it has appeared and reappeared in different countries in batches; in Sweden the period 1850–81 yielded a large batch of publications. In Germany similar publications were practically confined to the period 1853–81, and in the Anglo-Saxon countries to the period 1853–92. Altogether about 125 publications were found to be worthy of special scrutiny, and even in this sifted material much evidence of doubtful value had to be discarded. Only 36 Anglo-Saxon, 8 German, and 17 Swedish publications contained reliable data, and it was noteworthy that comparatively recent observations were, on the whole, those on which least reliance could be put.

Differences in the Manifestations of Poisoning by Arsenic from Various Sources.

It is a very remarkable fact that the symptoms of poisoning vary greatly according as arsenic is taken by the mouth, is absorbed by workers in arsenic, or enters the system as the result of house poisoning. When arsenic is taken in large doses by the mouth, melanosis and polyneuritis are prominent sequels, whereas melanosis has never, and polyneuritis has rarely, been observed in cases of house poisoning. On the other hand, workers in arsenic, in contact with Schweinfürth's green, are liable to suffer principally from cutaneous lesions such as erythema, papular and pustular eruptions, and even gangrene. These manifestations are practically unknown in cases of poisoning with arsenic given by the mouth, and it is therefore probable that in industrial arsenical poisoning the arsenic acts directly on the skin, the face, neck, and hands being the parts most affected. No case of industrial arsenical poisoning has yet been recorded in which melanosis was seen. Arsenic given by the mouth provokes digestive disturbances such as diarrhœa and also conjunctivitis, whereas in house poisoning the principal symptoms are lassitude, headache, giddiness, and irritation of the eyes and pharynx. Diarrhœa is comparatively rare and only in a few cases has polyneuritis been observed. The manifestations of these three different forms of arsenical poisoning being so distinctive, it has been suggested that in house poisoning some volatile compound of arsenic is responsible for the symptoms. Working on this suggestion, a member of the Commission, Dr. M. Ramberg, professor of chemistry, carried out investigations with regard to the development of arsenical gases from the action of arsenic on certain moulds. He came to the conclusion that the composition of the gases thus generated is inconstant, and he was unable to confirm Biginelli's hypothesis that the arsenical gas generated under these conditions is diethylarsine. Prof. Ramberg's and Prof. Petrén's last conclusion in this matter is that in arsenical house poisoning several highly toxic substances are concerned, the composition of which is still unknown.

Arsenic in the Urine of Healthy Persons.

One of the most important of the researches carried out under the auspices of the Commission was concerned with the demonstration of arsenic in urine of healthy persons. Until Dr. Bang began his investigations in this matter, it was generally held in Sweden that the demonstration of a certain quantity of arsenic in the urine was equivalent to the demonstration of arsenical poisoning. Little or nothing was known of the conditions under which, in health, the arsenical content of the urine might vary. After devising a new and delicate test for arsenic in urine, Dr. Bang found that the arsenic in normal urine might vary from a trace to 1 mg. per day. The great and rapid changes in the arsenical content of normal urine led Dr. Bang to investigate the arsenical content of various foods, and he found that while some vegetables contain little arsenic, others contain much. The amount of arsenic found in fish varied considerably, but in most cases it was amazingly great. The differences in the arsenical content of fish seemed to depend largely on the water in which they lived; some sea-water fish contained as much as 4 mg. per kilo. This discovery largely explains the inconstancy of the arsenic content of normal urine. At Prof. Petrén's hospital Dr. Bang examined for arsenic the urine of patients fed for a certain time on such articles of food as milk, cream, oatmeal, and eggs, which are poor in arsenic. While they were on this dietary their urine contained only traces of arsenic. But when, on several consecutive days, they were given a liberal dietary of fish, the arsenic content of their urine rose rapidly, and it fell again when the fish dietary was withheld.

Other Findings of the Commission.

A matter to which Prof. Petrén returns frequently in his paper is the great difference in the toxicity of various compounds of arsenic, and the differences in the reaction of the body to the same compound. In the case of salvarsan, for example, the reaction of the body would seem to depend to a certain extent on the nature of the pre-existing infection, and the reaction of syphilitics to salvarsan is probably peculiar to this class of case. Prof. Petrén gave neosalvarsan to patients suffering from influenza during the epidemic of 1918 and found that the first and only toxic effect was vomiting—an observation suggesting that the response of the influenza-infected body to salvarsan differs from that of the syphilitic patient. One of Dr. Brahme's most interesting observations referred to the behaviour of arsenic in relation to the cerebro-spinal fluid. He confirmed the observations of Tinel and Leroid, who found that while arsenic cannot reach the cerebro-spinal fluid through healthy membranes, it may do so when these membranes show morbid changes. Several other lines of research were followed by the Swedish Commission, the work of which has added not a little to our knowledge of the toxicology of arsenic and its compounds.

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[1] Acta Med. Scand., 1923, vol. lviii., Fasc. II.–III.
[2] Acta Med. Scand., Supplementum V., 1923.
[3] Urinens Fysiologiska Arsenikhalt. Svenska Arsenikkommissionens Betänkande, 1919, Supplement 11.

Public Health Services.

REPORTS OF MEDICAL OFFICERS OF HEALTH.

THE following table gives some of the principal health statistics of seven large towns for the year 1922:—

Name of town.	Estimated population (mid-year).	Birth-rate.	Death-rates per 1000 of population.				Death-rates per 1000 births.		
			All causes.	Tuberculosis.	Cancer.	Respiratory with influenza.	Infant mortality		Maternal mort. in childbirth.
							Legit.	Illegit.	
Edinburgh ..	423,155	20·7	15·2	1·3	1·5	2·6	88	128	3·8
Blackburn	129,376	16·8	14·2	0·9	1·3	3·8	97	140	7·0
Hull	294,000	24·2	14·4	1·4	1·2	3·7	101	210	3·9
Leicester	238,800	19·4	12·7	1·5	1·2	2·6	85	141	3·0
Portsmouth ..	236,630	22·1	12·1	1·1	1·2	2·3	61	100	2·6
Preston	120,900	20·5	13·7	1·2	1·0	3·4	96	129	4·8
Stockport	125,800	17·4	13·4	1·1	1·3	3·7	76	96	7·3

All these towns suffered from the influenza epidemic during the first quarter, but it is perhaps justifiable to attribute the lessened fatality of respiratory diseases in Edinburgh, Leicester, and Portsmouth to the cleaner air when comparison is made with Blackburn, Preston, and Stockport. The three last-named towns also show a high maternal mortality in childbirth. The effect of the boot and shoe trade is no doubt seen in the tuberculosis mortality rate of Leicester. The table brings out the fact that cancer now frequently causes more deaths than all forms of tuberculosis and the marked difference that still exists between the mortality of illegitimate and legitimate infants, in spite of maternity and child welfare work.

Edinburgh.

Dr. William Robertson presents the report for a year during most of which the late Dr. Maxwell Williamson was medical officer of health, and in doing so suggests that future policy must be directed at prevention in its fullest and most literal sense. Edinburgh, he says, has splendidly equipped institutions for coping with epidemic diseases and tuberculosis, and it should now be our aim to reduce the demands on these institutions. Dr. Robertson looks forward to the ensuing years when big improvements in Edinburgh housing conditions may be confidently expected. "No matter in which direction he may turn, the sanitary reformer will always find the spectre of the housing problem facing him."

Dr. T. Y. Finlay's report on child welfare mentions that the Toddlers' Play centres continue to fulfil a useful and necessary piece of work. Of 58 notified cases of ophthalmia neonatorum, one case had both eyes damaged and in two cases it was recorded that previous children in the family had been affected by the disease. Dr. John Guy, the tuberculosis officer, shows that the decline in pulmonary tuberculosis was only retarded, but never ceased, during the war, and that in 1922 the number of deaths was the lowest ever recorded. It is admitted that Edinburgh and Glasgow suffered less from fat restrictions during the war than English towns, and one wonders to what extent this factor accounted for the very varying results obtained as between one town and another. Dr. Guy emphasises the importance of milk as a cause of non-pulmonary tuberculosis, and states that 30 per cent. of gland cases, 18 per cent. of meningeal cases, 50 per cent. of abdominal, 58 per cent. of bone, and 50 per cent. of lupus cases are due to this cause. The importance of segregation of infectious cases is insisted upon and an estimate is given that, at present, infectious cases are segregated during one-third of the period of infectivity

Dr. Claude B. Ker mentions that the staff of the City Hospital has been subjected to the Schick test and that those who gave positive reactions have been inoculated with toxin-antitoxin mixtures. Mr. David Lees, the V.D. medical officer, states that there is a marked improvement in the attendances and the number of cases completing treatment. There is, however, urgent need of a treatment centre and hostel accommodation for merchant seamen near the docks, in order to secure continuity of treatment.

Blackburn.

Dr. W. Allen Daley's report shows that the Blackburn Corporation is actively engaged in improving sanitary conditions. Nearly 9000 pail closets have been converted into water closets or abolished since 1920. Blackburn is supplied with water from upland gathering grounds. An investigation of the plumbo-solvent properties of the water was undertaken during the year. The public analyst, Mr. W. H. Roberts, reports that the water is soft, of good quality, and practically neutral, and that its action on lead is so slight as to be negligible. Dr. Daley reports a shortage of houses. The Corporation completed 89 houses during the year. Applicants show a preference for non-parlour houses. There is some serious overcrowding and over 100 houses are past repair, but cannot be closed. There is considerable undesirable subletting, and Dr. Daley thinks there is a demand for small cottage flats. A campaign is in progress against the smoke nuisance and another in favour of clean milk. Energetic steps are being taken to improve the ventilation and hygiene of the cinemas. Attention is being given to the better protection of food from contamination. Particulars are given of the present condition of consumptive patients discharged from the Blackburn Corporation Hospital and Meathop Sanatorium during past years. In the case of the former, 82 of 709 patients discharged since 1913 are at full work, 350 are dead, and 96 cannot be traced. In the case of Meathop, 63 of 445 patients discharged since 1908 are at full work, 177 are dead, and 79 cannot be traced. The window-cleaning business managed by the Charity Organisation Society for ex-sanatorium patients is in a prosperous condition. Dr. Daley comments on the high mortality associated with childbirth and looks to efficient and popular ante-natal clinics, combined with adequate maternity home accommodation, to bring about an improvement. The maternity home accommodation will be increased during 1923.

Hull.

Dr. J. Wright Mason reports that the maternity and child welfare work has been reorganised under a whole-time medical officer, Dr. Katherine Gamgee, who began work in June, 1922. Attention is called to the high death-rate among babies suffering from ophthalmia neonatorum and the laxness of the midwives in notifying this condition. Comment is made on the high infant mortality rate and the fact that Hull compares badly with other towns during 1922 with respect to diarrhœa. 334 municipal houses were completed during the year. On account of the housing shortage, many older houses, intended for one family only, are now being occupied by two or more families.

Leicester.

Dr. C. Killick Millard reports three important events during 1922—viz., the retirement of Alderman Windley after 46 years as chairman of the Health Committee, the retirement of Chief Sanitary Inspector Braley after 50 years' service, and the decision to acquire new premises for the Health Department outside the Town Hall. Alderman Windley's service has been commemorated by the establishment of four secondary school scholarships named after him. Dr. Millard thinks the housing shortage may have increased the marriage rate. Formerly young people "saved up" for furniture. Now they need not wait "to save up."

The Leicester leaflet giving elementary facts with regard to cancer has aroused many expressions of approval. Dr. Millard would like to see a campaign started to bring home to the public the disastrous effects of dental caries. His remarks deal chiefly with early treatment. The leaflet on prevention published in our issue of August 4th (p. 265) might well form a basis for such a campaign. Leicester, unlike Edinburgh, showed a very definite increase of deaths from pulmonary tuberculosis during the war, but the average number of deaths for the four post-war years is lower than that for the four pre-war years.

An open-air school is needed in Leicester. Very good work has been done by the seaside summer camp at Mablethorpe, where 593 children spent a fortnight last year. Dr. Bessie Symington, M.O. of the Women's V.D. clinic, reports that great efforts have been made to persuade mothers to come up for treatment during pregnancy. None of the 26 syphilitic mothers treated gave birth to a diseased child. In spite of the fact that both maternity homes have ante-natal clinics, it was not possible to persuade any of the mothers attending these ante-natal clinics to go for treatment to the V.D. clinic. This confirms he view of those who think that in order to secure adequate treatment of the expectant mother suffering rom venereal disease, it is necessary to provide such treatment at the ante-natal clinic. The health committee have decided to obtain Grade A (tuberculin tested) milk for the Isolation Hospital Sanatorium, maternity home, and day nursery. Although visitors from northern towns regard Leicester as a clean-air town, it is pointed out that there is considerable room for improvement as regards smoke abatement. "Shortage of housing accommodation," says Dr. Millard, "remains Leicester's most crying need."

Portsmouth.

Dr. A. Mearns Fraser says the one subject above ll others to which he must specially refer is the urgent necessity for the provision of housing accommodation. He believes that the problem can be olved by the rapid development of the splendid site n Portsdown Hill (524 acres). The Corporation ave completed 543 houses, but the position is hardly ess acute than it was two years ago. There are 000 urgent applications for houses, many unfit ouses cannot be closed, and one unhealthy area, ncluding some deplorable houses, cannot be dealt ith. The Portsdown Hill site Dr. Fraser regards s ideal, and he would have every effort made to induce rivate builders to develop it. In six of the 17 notified ases of enteric, improperly cooked local shell-fish, ockles, winkles, and butter-fish, were suspected as he cause. The war rise in the death-rate from ulmonary tuberculosis is well brought out by a hart. Since the war the rate is lower but tends to be tationary, and the greatest hope for the continuance f the decline lies, Dr. Fraser thinks, in an improvement in housing and the development of the Portsdown Hill estate. During the year 12,000 gallons f electrolysed sea-water disinfectant were manufactured by the municipality. The public analyst, r. Reginald P. Page, lays stress on the fact that the ddition of chemical preservatives to food is steadily n the increase, and instances samples of "home-made" mincemeat, containing no spirit preservative ut salicylic acid.

Preston.

Dr. F. A. Sharpe says the shortage of houses is not causing numerical overcrowding because the population is practically stationary, but that it is causing the loss of comfort, domestic necessities, and decencies, owing to the housing of more than one family in a house. One of the great needs of Preston is a home nursing service. In December, 1922, an unsuccessful attempt was made in the committee to reduce the permissible limit for black smoke emission from factory chimneys. There are about 135 factory chimneys in the borough and they are apparently permitted to emit five minutes of black smoke every half hour. Fortunately they do not all avail themselves of this privilege. Several of the seven proved cases of enteric fever were attributed to polluted mussels. There was a slight increase both in notifications of and deaths from tuberculosis during the year.

Dr. Mary Lowry, the maternity and child welfare medical officer, discusses the causes of high maternal mortality from childbirth. Arrangements have now been made to admit cases of puerperal fever to the isolation hospital. Of the nine deaths from other accidents, &c., of pregnancy, Dr. Lowry, after investigation, thinks that at least three might have been prevented had the woman been under skilled ante-natal supervision. There is as yet no definite coöperation between the ante-natal and V.D. clinics. The school medical service has not been reduced in scope, but the existing organisation is insufficient to deal with the requirements of the dental and minor ailments treatment clinics. The appointment of an additional dental surgeon is badly needed.

Stockport.

Dr. Arthur G. Jenner reports that the housing question is still unsatisfactory. The work of the various health centres—namely, tuberculosis, V.D., and child welfare—has progressed favourably during the year. It is doubtful if the maternity home (10 beds) will be large enough to meet the increasing demands made upon it.

SCHOOL MEDICAL SERVICE.

Cumberland.

AN instructive and outstanding feature of this report is the appendix containing a detailed survey of the county scheme for dealing with cripples. Up to the end of 1922 a total of 257 cases of crippling had been brought to the school medical officer's notice, and of these over 95 per cent. were cases of serious crippling ranging from simple club-foot to paralysis involving all four limbs. Interest in the scheme appears to have been thoroughly stimulated in the county, and names were submitted by members of the Education Committee, by the medical and nursing staff of the county, by the organisers of physical training, by private practitioners, teachers, and members of the general public. Dr. Kenneth Fraser, the deputy school medical officer, reports that the weakest point in the organisation is the discovery of early cases—that is, children under school age. With all these sources of information the register is not yet made up to date and new cases are coming to light every week. Owing chiefly to the fact that the numbers and length of stay would be an impossible tax on the local cottage hospitals, the cases are sent to hospitals outside the county—Shropshire Orthopædic Hospital and the Ethel Hedley Hospital, Calgarth Park, Windermere. Cases are classified according to urgency either on clinical grounds or on age.

After-care is a fundamental part of the scheme, and under this heading is included not only the after-treatment of hospital cases but the preliminary treatment by plaster, remedial treatment, &c., of cases before admission, in order to shorten the period of stay. Under it is also included the provision of appliances and re-education. The development of an adequate system of after-care has presented more difficulty than all the rest of the scheme put together and remains the greatest tax on the medical and nursing staff. At the beginning of 1921 a joint scheme of after-care with other counties was approved, and four after-care clinics were established at Carlisle, Maryport, and Whitehaven, and after some delay the first clinics were held in August, 1922, and have been eminently successful; altogether 82 children have attended, making 174 attendances.

Remedial treatment and re-education is a fundamental part of the treatment, and the seven clinics for such treatment have been established in the county. These are used by some patients as a preliminary to hospital treatment and serve to shorten the time spent in hospital, thus reducing the cost. They are, of course, most useful in preventing the further development of slighter deformities. It appears most unfortunate that all remedial treatment in the elementary schools and in a number of secondary schools of the county has ceased since December, 1922, owing to the so-called economy campaign. A few points are given at the end of the report for authorities contemplating a scheme for dealing with cripples, and Dr. Fraser lays emphasis on the necessity for careful organisation of after-care, with a person in charge who knows all about plaster and appliances work and something about re-education of muscles.

During the year 12,548 school medical inspections were made, and Dr. F. H. Morrison has followed out his practice of the previous year and has not resumed the weighing and measuring of children, and the services of three whole-time nurses have been dispensed with.

Soke of Peterborough.

Of the 317 secondary school-children examined, only one case of uncleanliness was recorded. Again Dr. Christopher Rolleston acknowledges his indebtedness to the school nurse. "I am every day, in every way and in every respect more and more indebted to Nurse Bean for her valuable services." In addition to attending at all medical inspections and reinspections, she has made 4990 examinations for cleanliness and paid 470 visits to homes on account of non-attendance from illness. She also paid 574 home visits for the purpose of arranging for treatment of physical defects. Dr. Rolleston, commenting on our lamentable lack of bathing facilities, recalls how grossly inefficient our arrangements for cleanliness are compared with the time of the Roman Empire. "Even small farmhouses near Pompeii were provided with bathrooms. Surely the freedom from certain forms of contagious disease in classic times depended on this wise expenditure of public and private funds." Dr. Rolleston's report is as usual most interesting and packed full of instructive suggestions.

MENTAL HOSPITALS SERVICE.

The annual report of *Croydon Mental Hospital*, Warlingham, records with some satisfaction a recovery rate for the year of 57 per cent. This institution, which was opened in 1903, was the first in England to be described as a mental hospital, and may, therefore, be said to have set an example to which some of the subsequent progress elsewhere is indebted. Its therapeutic resources resemble those of a general hospital, and importance is attached to the value of specialised methods of treatment. The hospital is at present overcrowded to the extent of 51 males and 39 females, and it seems possible that contracts with other institutions may be necessary in order to relieve this congestion. The post of pathologist and third assistant medical officer is vacant.

At the *Worcestershire Mental Hospital*, Barnsley Hall, Bromsgrove, the post of second assistant medical officer is vacant, and it appears that only one medical officer, in addition to the superintendent, is at present available for the care of about 730 patients. No explanation of the apparent failure to fill this vacancy appears in the report. No report of a Commissioner of the Board of Control appears in this issue.

Correspondence.

"Audi alteram partem."

HEART DISEASE IN EARLY LIFE.

To the Editor of The Lancet.

Sir,—Dr. G. Arbour Stephens's letter on the above subject in your issue of to-day's date deals with the great divergence of opinion as to the value of the salicylates in the treatment of the acute rheumatic state, which found expression at the recent meeting of the British Medical Association; and it urges the appointment of a commission to investigate the whole problem. I fear that, in view of this great divergence, the labours of such Commission would not bear much fruit, and this very largely because of the strange mental attitude (so it strikes me) of many doctors towards remedial treatment, especially by drugs. Thus Dr. Stephens uses the term "powerful poison" when speaking of the salicylates. Now the question of poison for every medicament is wholly a matter of dose, and, given careful dosage, surely the great body of medical opinion would pronounce unhesitatingly in favour of the salicylates as valuable remedies in acute rheumatism; or would anyone propose that we should revert to the use of the unaided alkalies, blisterings, &c., which our predecessors were so thankful to exchange for the salicylates?

One contributor to the B.M.A. discussion describes "the treatment of rheumatism by pharmacopœial doses of salicylates as only playing with a serious disease." I gather that what is meant is that we must go to the root of the matter and prevent rheumatism. The answer would be, "By all means this must be our endeavour"; but *meanwhile*, until we have reached that goal, and when faced by the attack, do we know of any other means of cutting short and mitigating the disease so effective as the salicylates? And is the alleviation of disease "playing" with it? Another holds that salicylate has not "diminished the incidence of carditis"—that is a statement very difficult of proof, but supposing it to be established, what then? Why then do not use it for that purpose be content with lowering and cutting short the fever and relieving the pain. If it be impossible to prevent the entry of the "strong man" upon the scene, we can at least mitigate the situation by disarming him in part.

Let us then use a drug for what it can do and not abuse it for that which it cannot compass; remembering always that there is but one rule in treatment—namely, to reach back into the morbid sequence of cause and effect *as far as we can and attack it there*; so doing we shall prevent or palliate, as the case may be, secundum artem.

I am, Sir, yours faithfully,
Harrington Sainsbury.

Wimpole-street, W., Sept. 1st, 1923.

DECAPSULATION OF THE KIDNEY IN ECLAMPSIA.

To the Editor of The Lancet.

Sir,—The growing experience that decapsulation of the kidney in eclampsia with anuria is a life-saving procedure—an example of which you quote and discuss in your issue of August 18th—calls for some comment and especially for this, that it presents the climax of the argument that eclampsia is simply the result of visceral disabilities determined by mechanical circulatory difficulties arising locally in pregnancy. It shows that the convulsions are not due to some specific toxin, or to the absence of some specific anti-body, as some have supposed, but result from failure of the excretory organs. Already the idea of a specific toxin in pregnancy (whether placental or endocrinal in origin), producing a toxæmia and eclampsia, is decadent—the results of the Dublin treatment indicate plainly enough that the pre-eclamptic toxæmia is simply a toxæmia due to an accumulation of "normal" waste products in the blood, that eclampsia is simply a uræmia. But the effect of decapsulation of the kidney indicates that the visceral disability (as far as the kidney is concerned) is caused by a circulatory difficulty arising within the kidney itself. Thus, in the case you have quoted, you refer to "the rapidity with which the operation had effect"; the effect, indeed, "was immediate." "Most recent authors," you say, "take the view that the chief effect lies in the mechanical relief of the renal tension," and, indeed, that "the French writer Pousson speaks of 'glaucoma of the kidney.'"

This last remark interests me greatly, for I have for long regarded the necrosis of the retinal cells in glaucoma as analogous with the necrosis of the renal cells in eclampsia, and have discussed the pathology of the former condition with certain ophthalmological friends. Just as in glaucoma the eyeball becomes "stony," so in eclamptic anuria is the kidney found "hard." It is plain that if the tension within the eyeball rises sufficiently the blood flow through the retinal capillaries will cease; and it is clear that if this obstruction persists, a necrosis of the retinal cells must occur. If the condition is recognised early and dealt with, the loss of vision (due to a functionless state of the cells) is restored; but if the condition persists, relief of the tension, even though it restore the blood flow through the retinal capillaries, cannot be hoped to give good functional results since the cells have become dead. The condition of the kidney in eclampsia is similar; in early stages (of anuria) the loss of function can be restored by re-establishing the flow of blood through the renal capillaries; but if the anuria persists several days (as in some reported), decapsulation of the kidney, even though it restore the blood flow through the kidney, cannot be expected to have the same result. Thus, decapsulation of the kidney should be done as soon as anuria is discovered, or as soon as it is found to persist in spite of all other measures.

How the increase of intra-ocular tension ending in glaucoma arises does not concern me; in the case of the kidney in eclampsia, there are two possible views. There is the view that the state of the kidney arises simply from the effect of a specific toxin or of the rise of normal waste products in the blood, and there is the view that it is due to mechanical circulatory difficulties induced within the organ by the pregnancy. It is difficult to understand, if the lesion affecting the renal cortical cells is due primarily to the effect of a poison, how decapsulation can affect the tissue. Were the renal lesion in eclampsia inflammatory in type, the case would be different, but it is non-inflammatory. There is a certain amount of round-celled infiltration, but Ludwig (1864)[1] showed that such occurred if one clamped the ureter even for one hour. He also showed that the kidney swells, that the uriniferous tubules become dilated, that the blood flow from the renal vein is reduced. Brodie (1914) showed that if a tate of diuresis is induced and the ureter clamped he kidney swells, becomes tense and hard, and "almost bloodless"; and that if the kidney be decapsulated and the ureter clamped the uriniferous ubules and Bowman's capsules become much more dilated, the whole organ becoming larger.[2] Clamping the ureter, obviously, must cause the uriniferous tubules to distend; and it is clear that the istension of these tubules, reacting with the capsule f the whole organ, must obstruct the blood flow hrough the renal capillaries.

Whilst in the past certain authors have thought that ureteral obstruction—e.g., at the pelvic brim—is a ause of eclampsia, we must believe that the dilatation f the cortical uriniferous tubules (such as Clifford White found in his cases[3]) is due to a mechanical difficulty arising within the kidney itself; that a block occurs, for instance, in the intermediary zone, causing a distension of the cortical uriniferous tubules which determines an occlusion of the blood capillaries about these tubules and the prevention of a blood flow through. This idea is supported by the occurrence of anuria as a result of rapid relief of urinary pressure in such cases as those of long-standing congenital phimosis and prostatic disease.[4] It is not very difficult to work out the process ending in such a block, at least in the latter conditions; but I must not encroach on your space to unfold this idea. It is obvious that on decapsulation of the kidney in such a state the intra-renal tension will be immediately reduced; that not only can the blood flow more readily through the kidney (in the absence of thrombosis), but that urine in cortical uriniferous tubules can more readily escape. That such a tension in eclamptic anuria exists is shown (as I have indicated) by the hardness of the kidneys found at operation (it is a state to which C. White expressly refers); and that such a mechanism is in play is demonstrated by the rapidity of the effect of the operation. The good results of decapsulation show that the degeneration and necrosis of the renal cells are not due to a primary thrombosis (the thrombosis, as I have previously urged, is secondary, not primary[5]); nor can we believe that cases of symmetrical necrosis of the renal cortex (an end-result of the condition we are considering) is due to an endarteritis to which it has been referred. The necrosis, presumably, is a late result (as is the retinal necrosis in glaucoma); and we must believe that had decapsulation been performed early enough in such cases restoration of function most probably would have resulted.

I am, Sir, yours faithfully,

R. H. PARAMORE, F.R.C.S. Eng.

Brook-street, W., August 23rd, 1923.

ACCIDENTAL VACCINIA.

To the Editor of THE LANCET.

SIR,—In view of the prevalence of vaccination it may be of interest to refer to an incident which occurred recently in my own practice. On the evening of July 24th a woman visitor from Birmingham consulted me for an "insect bite" on her right upper eyelid. She stated that the swelling had begun to appear on the morning of the 23rd, but evidently it had spread, for when I saw her she was quite featureless, while the puffiness of the lids was so pronounced that she could not see out of her right eye. In the centre of the upper lid was a scab, but it was not until this scab had been removed by bathing with warm hydrogen peroxide solution that I was able to obtain a clear view of the underlying cause. Then there appeared a clear vesicle rather larger than a sixpence deeply embedded in the tissues, and with a circular depression in the centre having all the appearances of a vaccination mark prior to the development of the pustular stage on the sixth or seventh day following inoculation of the virus. This led me to make further inquiries, and thus I came into possession of some quite useful information. Briefly the sequence of events was as follows:—

July 6th: Baby vaccinated, arm left uncovered.

17th: Baby scratched his mother on upper lid; the mark left by his finger-nails was clearly visible on the following day.

23rd: Lid began to swell up.

24th: A fully-formed vesicle was apparent in that situation, and developed after the manner of a cow-pox vesicle.

31st: The vesicle had shrivelled up, but the scab remained adherent while showing signs of separating at the margin. All traces of the swelling had gone.

It is probable that I should not have recognised the condition had it not been for a similar experience which befell me in the out-patient department of the

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[1] Ludwig: "Ueber die Beziehungen zwischen dem Bau und er Leistung der Niere," Wiener Med. Wochenschr. Ap., 1864, No. 15, p. 226.

[2] Brodie: A New Conception of the Glomerular Function, roonian Lecture, Proc. Roy. Soc., 87B, 571–592.

[3] C. White: Two Cases of Puerperal Anuria, Proc. Roy. Soc. Med., Obstet. and Gyn. Sec., 1919, vol. xii., p. 27.

[4] Paramore: Remarks on Uræmia, Proc. Roy. Soc. Med., Urol. Sec., vol. xvi., No. 5, p. 29. (November, 1922.)

[5] Paramore: Eclampsia and Its Incidence, THE LANCET, 1921, ii., 1147.

Westminster Hospital in the spring of 1906. One day a woman presented herself with an angry-looking pustule on the cheek, which I at first mistook for a malignant pustule, until my mind was set at rest by the surgeon in charge of out-patients inquiring all about the health of some infant of whose existence he seemed to be perfectly well aware, although he had not, so far as I could tell, ever been informed of its arrival.

Probably on account of the rarity of vaccination on parts of the body other than the arms and legs, no mention is ever made of the possibility of this condition being mistaken for that of anthrax, yet the resemblance is very close when, as in the case just mentioned, there is an outer ring of vesicles, and a *dark* scab forms from admixture with blood. The history is the most important thing, and next to that the presence or absence of severe constitutional disturbance. Even so, it is as well to bear in mind that vaccinia is sometimes severe, and that not every individual infected with anthrax is doomed.

I am, Sir, yours faithfully,

Bournemouth, August 30th, 1923. J. Stanley Avery.

THE FORAMEN OF MAGENDIE.

To the Editor of The Lancet.

Sir,—May I remind Prof. Wood Jones that Sir John Bland-Sutton's discovery of the non-existence of Magendie's foramen has been confirmed by F. Coupin, who shows, in addition, that the two lateral foramina of Luschka are also artefacts. The roof of the fourth ventricle is extremely fragile, and is very easily torn in dissections or in preparation of microscopical sections. Coupin found that all these three foramina are absent in the mouse, rat, guinea-pig, kitten, and young rabbit; and in his second paper he found the same thing in scyllium canicula, torpedo, carassius, and rana temporaria. In none of these animal forms is there any direct communication between the cavity of the fourth ventricle and the subarachnoid spaces. His papers are in the "Comptes Rendus de la Société de Biologie," (*a*) 1920, lxxxiii., p. 954, and (*b*) 1921, lxxxiv., p. 913.

I am, Sir, yours faithfully,

London, N.W., August 31st, 1923. Leonard J. Kidd.

THE STATUS OF PATHOLOGY.

To the Editor of The Lancet.

Sir,—The science of pathology is a branch of biology, but, while all other branches of biology are recognised as sciences by our universities, no university recognises pathology as such, nor is the Pathological Society regarded as one of the scientific societies. Pathology is rather regarded with contempt as a branch of medicine which any medical man is competent to teach. Hence we sometimes find that important posts in pathology are filled by the appointment of men who have had no experience in the subject, while those who have spent years in junior posts are passed over. We also find in some universities that the pathological department is run on commercial, rather than on scientific, lines, and it is the only department to be exploited in this manner.

Will not one of our universities take the initiative in raising the status of pathology—

1. By instituting a chair of general pathology.
2. By recognising general pathology as a subject for degrees in the faculty of science.
3. By establishing a course of training for pathologists of a standard equivalent to that of the honours courses in other branches of science.
4. By imposing on the staff of the pathological department the same restrictions as to outside work as are imposed on the staffs of other departments.

I quite recognise that there may be a difficulty in recognising pathology as a subject for science degrees, because, owing to the nature of the subject, the degree would, almost of necessity, have to be a post-graduate degree. If these difficulties are held to be insuperable a diploma might be instituted.

I may say that it is not only the universities which regard pathology with contempt. The medical profession itself regards the pathologist as an inferior order of being to whom the rules of medical etiquette do not apply. What an outcry there would be if the universities carried on clinical practice by means of their professors and lecturers in clinical subjects as they now carry on pathological diagnosis by means of their pathological staffs!

I am, Sir, yours faithfully,

Manchester, Sept. 1st. Charles Powell White.

LONDON PANEL: POST-GRADUATE COURSES.

To the Editor of The Lancet.

Sir,—Further courses of post-graduate instruction have been arranged by the London Panel Committee with the assistance of the authorities of Guy's Hospital, to take place in the coming autumn. The courses will be held in general medicine, midwifery and gynæcology, and in the diseases of the ear, nose, and throat. Each course will consist of ten lectures of one hour's duration and will probably commence on Sept. 20th. The classes will be held simultaneously on Thursday afternoons at 4 p.m. The fee for each course will be £3 3*s.*, payable in advance to me, and cards of admission will be issued. There will be special instruction in the treatment of diabetes by insulin and in the treatment of tuberculosis by Dreyer's diaplyte vaccines. Early application for inclusion in either of the above courses should be made as the numbers admitted will be limited.—I am, Sir, yours faithfully,

Robt. J. Farman,
Secretary, Panel Committee for the County of London.
Staple House, 51, Chancery-lane, W.C. 2,
August 29th, 1923.

Obituary.

ERNEST FRANCIS BASHFORD, O.B.E.,
M.D., Ch.B. Edin.

Ernest Francis Bashford died suddenly of heart failure on August 23rd, at Manderscheid, Eifel, Germany, at the early age of 49. He was born at Bowdon, Cheshire, in 1873, educated at George Heriot's Hospital School and Edinburgh University, graduating M.B., Ch.B. in 1899 and M.D. 1902, after a distinguished academical career. He travelled to Germany as holder of the McCosh Scholarship of Edinburgh University, and later of a Grocers' Scholarship, and studied under the late Prof. Ehrlich at Frankfort. Later he was assistant to Prof. Liebreich in the Pharmacological Institute in Berlin. He returned to Edinburgh in 1902 as assistant to Sir T. R. Fraser, and while there published his well-known monograph on the pharmacological antagonism of atropine and morphine.

In 1902 Bashford was appointed director of the newly founded Cancer Research Fund, a position which he held till 1914, when he resigned through ill-health. During these 12 years he held a prominent position in cancer research in this country and on the Continent and built up the organisation of the Imperial Cancer Research Fund as an experimental research institute. His work at the Imperial Cancer Research Fund will best be remembered by the numerous contributions on the zoological and ethnological distribution of cancer, national and hospital statistics, the phenomena of transplantability of animal tumours and the induced resistance to them. Into the controversies which raged around these topics he threw himself with enthusiastic energy.

Dr. Bashford served in the R.A.M.C. from 1915 till the end of the war and afterwards in the Army of Occupation till some months before his death. He leaves a widow and one daughter, to whom the greatest sympathy will be extended.

EDWARD ALEXANDER WHITE, M.D., M.CH., L.M. R.U.I.

Dr. E. A. White, the oldest practitioner in the Isle of Thanet, died at Margate on July 18th, aged 70 years. He was educated at Queen's College, Belfast, and qualified M.D., M.Ch., and L.M. in 1877. After practising for a short time in London, he entered into partnership at Margate with the late Mr. W. H. Thornton and the late Mr. W. Knight Treves, nearly 50 years ago. For many years he held the appointment of visiting physician to the Isle of Thanet Isolation Hospital, a post which he gave up a few months ago owing to failing health. On his resignation he was appointed consulting physician to the hospital. In his earlier years in Margate he was district medical officer, and held numerous club appointments before the National Insurance Act was passed. He was also surgeon to the local battery of the Cinque Artillery Volunteers, resigning his commission when the Territorial system was introduced. Ten years before his death White underwent a grave operation and afterwards gradually relinquished active practice, though he attended some of his old patients until a few weeks before his death from cerebral hæmorrhage. His last public appearance was at the dedication of the "White" bed, which he endowed at the Margate Cottage Hospital in memory of his second son, who gave his life on the shores of Gallipoli. Edward White was greatly loved by his patients, and though his activities had been greatly limited by his loss of health, those who knew him in his prime will always cherish the memory of one who was a kind and generous friend as well as a beloved physician.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg.-Comrs. W. H. Edgar to *Cyclops*; F. E. Bolton to *Victory*, for R.N. Hospital, Haslar, and as specialist in diseases of the nose, ear, and throat, temp.; H. M. Langdale to *Dolphin* and as Senior Medical Officer of Submarines; F. G. Hitch to *Pembroke*, addl., for R.N. Barracks, Chatham; and S. W. Grimwade, O.B.E., to R.N. Hospital, Plymouth; H. B. Ormsby to *Caledon*; and E. H. Townsend to *Calcutta*, and as Squadron Medical Officer (on recommg.). C. V. Griffiths, D.S.O., L. Lindop, H. H. Babington, E. C. Holtom, O.B.E., E. C. Sawdy, and F. Cock to *President*, addl., for three months' hospital course.

Surg. Lt.-Comrs. H. B. Barker, D.S.C., to R.N. Hospital, Malta; A. C. Shaw to *Valiant*; C. M. Williams to *Warspite*; H. Wilks to *Pembroke*, addl., for Sheerness Yard; J. B. Crawford to *Victory*, addl., for R.M. Division, Forton, temp.; J. T. Wylie to *Dwarf*, on recommg. (to take passage in *Ajax*) and J. T. Wylie to *Fitzroy* (appt. to *Dwarf* cancelled).

Surg.-Lts. T. Madill to *Victory*, for R.M. Eastney, temp.; A. G. L. Brown, D.S.C., to *Dwarf* (on recommg.), to take passage in *Ajax*; N. A. H. Barlow to *Queen Elizabeth*; J. W. Tighe to *Campbell*; and A. P. Anderson-Stuart to *Southampton*.

Surg.-Lt. J. A. Ainley, is promoted to rank of Surg. Lt.-Comdr.

ROYAL NAVAL VOLUNTEER RESERVE.

Late Temp. Surg. (R.N.) J. E. Purves transferred to permanent list of R.N.V.R. as Surg.-Lt. and attached to the Scottish Division, List II.

The following late temp. Dental Surgeons have been transferred to the permanent list as Surg.-Lts. (D.): T. P. Cooper (attached to London Division, List 11); G. W. E. Holloway (attached to London Division, List 11); A. G. D. Pridham (attached to Bristol Division, List 11); D. C. Lamond (attached to Scottish Division, List 11); E. G. Parkinson (attached to London Division, List 11); G. R. D. Hankinson (attached to Sussex Division, List 11); and A. C. Bloomer (attached to Tyne Division, List 11).

ROYAL ARMY MEDICAL CORPS.

Maj. W. W. Browne, O.B.E., relinquishes the temp. rank of Lt.-Col.

Capt. H. D. Lane, M.C., retires receiving a gratuity and s granted the rank of Maj.

Lt.-Col. H. F. Shea, D.S.O., is restd. to the estabt.

Capt. P. Carney, M.C., retires receiving a gratuity and s granted the rank of Maj.

TERRITORIAL ARMY.

Capt. F. B. Chavasse, M.C. (late R.A.M.C.), to be Capt.

INDIAN MEDICAL SERVICE.

Lt.-Col. E. L. Perry, D.S.O., to be Col.

The King has approved the retirement of the following officers: Col. R. G. Turner, C.M.G., D.S.O.; Sen. Asst. Surg., with rank of Maj., E. J. Murphy.

The King has approved the relinquishment of his temp. commn. by the following officer: Capt. Gnanadickam Ira Benjamin, and is permitted to retain the rank of Capt.

ROYAL AIR FORCE.

Flying Officer J. D. Leahy, M.C., is granted a permanent commission.

The following appointments in the Royal Air Force are notified: Flight-Lt. (Medical) A. F. Rook to R.A.F. Central Hospital, Finchley; Flying Officer G. Clark to R.A.F. Hospital, Cranwell.

Medical News.

CIVIL SERVICE OFFICERS: REDUCTION OF BONUS.—A circular, No. 439, has been issued to local authorities by the Ministry of Health setting forth the new scale of reduction of bonuses payable to permanent civil servants. On wages and salaries not exceeding £500 per annum the bonus will be reduced from Sept. 1st, 1923, by a further 1–26th (making 11–26th in all since September, 1921). This scale is based on an average cost of living figure of 75. In the case of salaries over £500 a year a corresponding reduction of bonus will be made, and the bonus will still be subject to the special percentage deductions specified in paragraph 2 of the statement appended to the circular No. 233 of August 30th, 1921, subject to the following provisos: (1) That ordinary remuneration above £500 a year shall not involve lower total remuneration than ordinary remuneration of £500 a year. (2) That the higher percentage deductions specified in the statement take effect at the exact £700, £800, &c., of ordinary remuneration, and the total remuneration for those points constitute a maximum which may not be exceeded in the case of remuneration just below, for which the percentage deduction is lower. (3) That in no case shall bonus be payable at a rate which will raise the total remuneration above £2000 per annum. In so far as insurability under the National Health and Unemployment Insurance Acts is determined by rate of remuneration, Civil Service officers (employed otherwise than by way of manual labour and in receipt of bonus on the Civil Service scale) whose salary plus the reduced bonus does not exceed £250 per annum should thus be treated as insurable from Sept. 1st.

THE "FIELD" DISTEMPER FUND.—The buildings, for which the Fund has authorised the payment of £3540, are shortly to be erected on a portion of the ground on the experimental farm of the Medical Research Council at Mill Hill. The portion of the ground reserved for this investigation will be surrounded by an unclimbable fence forming a compound in which will be situated the kennels and the bungalow for the kennel maids; while in the wall of the compound will be placed a building to be used as a cleansing room, which will afford the only means of egress or ingress into the compound. There will be also in the wall of the compound another building to be used as a store and for preparing the food for the dogs, which will be passed through a small hatch and carried away in a sterile vessel. Coals will be carried into the compound through a similar hatch. The cleansing room consists of an outer chamber, a bathroom, and an inner chamber. All persons who have to enter the compound, as well as the kennel maids, must pass through this building; on entering they have to leave their outer garments in the first chamber, have a bath, and put on sterilised clothes in the inner chamber before entering the compound. The bungalow for the kennel maids is already built, and contains good sleeping and sitting-room accommodation, and a good cooking range. The kennels are arranged eight on each side of a corridor covered with corrugated iron and floored with cement; there is an open space between each set of two kennels, so that at any time two or four can be isolated. Each kennel is 8 ft. square, with a yard 36 ft. by 8 ft., and these yards are divided from each other by 6 ft. compo. wood divisions. The floors of the kennels will be of asphalt, and the yards will be floored with ashes, so that in the case of infection they can be replaced, limed, and disinfected. The roofs of the kennels will be made of ruberoid. The only other entrance into the compound will be the gate for the admittance of the dogs; the key of this gate will be kept by Mr. J. B. Buxton, F.R.C.V.S., who is in charge of the establishment. The hospital will not be situated within this compound, but at some distance away. It will be so constructed that if one side became infected that side could be completely shut off from the other side, and the experimental work could still be carried on in the uninfected portion. The hospital will be made fly-proof. It is further announced that an American Distemper Committee—several member of which have been coöpted on the British Council—has been formed. Sir William Leishman, F.R.S., having resigned from the Special Research Committee owing to his recent appointment as Director-General, Army Medical Services, Dr. C. J. Martin, F.R.S., has been appointed chairman of this committee.

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE, SPECIAL COURSE IN INFANTS' DISEASES, at the Infants Hospital, Vincent-square, Westminster, S.W.

Monday, Sept. 10th.—2–3.30 P.M., Dr. William Robinson: Lymphatic Diathesis. 4.30–6 P.M., Dr. Eric Pritchard: Demonstration: Uses of Dried Milk.

Tuesday.—2–3.30 P.M., Dr. Eric Pritchard: Acidosis in Infancy. 4.30–6 P.M., Dr. Helen Mackay: Nutritional Diseases with special reference to Rickets and Scurvy.

Wednesday.—2.30–3.30 P.M., Dr. Helen Mackay: Cases illustrative of Nutritional Disorders in the Wards and Out-patient Department. 4.30–6 P.M., Dr. Donald Paterson: Blood Conditions in Infancy; Demonstration in Research Laboratory.

Thursday.—2–3.30 P.M., Dr. Donald Paterson: Nerve Cases in the Wards and Out-patient Department. 4.30–6 P.M., Dr. Eric Pritchard: Demonstration in Milk Laboratory; Modification and Preservation of Milk.

Friday.—2.30–3.30 P.M., Dr. Eric Pritchard: Round Table Consultation. Special Cases for Diagnosis. 4.30–6 P.M., Mr. Tyrrell Gray: Lecture: Pyloric Stenosis. Demonstration and operation if possible.

Saturday.—Expedition by motor charabanc to Nursery Training School, Garden Suburb, Hampstead, and Sunshine House (Home for Blind Babies), Chorley Wood, leaving Royal Society of Medicine, 1, Wimpole-street, at 2.30 P.M.

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith-road, W.

Monday, Sept. 10th.—10 A.M., Mr. Maingot: Surgical Pathology. 12 noon, Mr. Simmonds: Applied Anatomy. 2 P.M., Mr. Addison: Surgical Wards.

Tuesday.—10.30 A.M., Dr. Paterson: Medical Wards. 12 noon, Dr. Burrell: Chest Cases. 2 P.M., Mr. Sinclair: Surgical Out-patients.

Wednesday.—2 P.M., Mr. Gibb: Eye Department. 3 P.M., Dr. Pernet: Skin Department.

Thursday —12 noon, Mr Simmonds: Demonstration of Fractures. 2 P.M., Mr. MacDonald: Genito-Urinary Department. 3 P.M., Dr. Scott Pinchin: Medical Out-patients.

Friday.—10 A.M., Mr. Dudley Buxton: Dental Department. 2 P.M., Dr. Burrell: Medical Out-patients. 2 P.M., Mr. Sinclair: Surgical Out-patients.

Saturday.—10 A.M., Dr. Paterson: Medical Diseases of Children.

Daily, 10 A.M. to 6 P.M. Saturdays 10 A.M. to 1 P.M., In-patients, Out-patients, Operations, Special Departments.

Appointments.

Cardon, A. G., M.B., B.Ch., has been appointed Assistant School Medical Officer, Sheffield.

MacKenzie, Ella, M.B., Ch.B. Edin., D.P.H., Assistant Medical Officer of Health of Blackburn.

Manchester Royal Infirmary: Witts, L. J., M.B., Ch.B. Manch.; Coleman, A., M.B., Ch.B. Manch.; Barlow, A., M.B., Ch.B. Manch., House Physicians. Parkes, M., M.B., Ch.B. Manch.; Fouldes, E. J., M.B., Ch.B. Manch.; Latham, T., M.B., Ch.B. Manch.; Bowman, B., M.B., Ch.B. Manch.; Fleming, W. A. J., M.B., Ch.B. Manch., House Surgeons. Sharp, C. J., M.B., Ch.B. Manch., House Surgeon to Special Departments. Bryce, A. G., M.D. Manch., F.R.C.S., Surgical Registrar.

Vacancies.

For further information refer to the advertisement columns.

Aylesbury, Royal Bucks Hospital.—R.M.O. £200.

Bristol Royal Infirmary.—H.S. to Ear, Nose, and Throat Dept. £120.

Carnegie Dunfermline Trust, Abbot-street, Dunfermline.—Asst. M.O. £550.

Central London Throat, Nose, and Ear Hospital, Gray's Inn-road, W.C.—Two Asst. Surgs. and Three Registrars.

Chester Royal Infirmary.—Asst. H.S. £150.

Dreadnought Hospital, Greenwich.—H.S. and H.P. Each £150.

East African Medical Service.—M.O. £600.

Exeter, Royal Devon and Exeter Hospital.—Asst. H.S. £150.

Glasgow District Mental Hospital, Gartloch.—Jun. Asst. M.O. £350.

Halifax Royal Infirmary.—Third H.S. £150.

Leicester City.—Asst. Tuberculosis O. £550.

London County Mental Hospital Service.—Seventh Asst. M.O. £432.

Manchester, Ancoats Hospital.—Res. M.O. £200.

Newcastle-upon-Tyne, Hospital for Sick Children.—Jun. R.M.O. £140.

Newcastle-upon-Tyne Royal Victoria Infirmary.—H.P.'s and H.S.'s, residents. £50.

Queen's Hospital for Children, Hackney-road, E.—H.P. and Cas. H.S. £100.

Redhill, Surrey, Royal Earlswood Institution.—Jun. Asst. M.O. £250.

Royal Chest Hospital, City-road, E.C.—R.M.O. £200. Also H.P. £120.

Royal National Orthopædic Hospital, 234, Great Portland-street, W.—H.S. £150.

Royal Naval Medical Service.—Surgeon-Lieutenants.

Royal Northern Hospital, Holloway, N.—H.S. £100. M.O. £150.

Saint Pancras Dispensary, 39, Oakley-square, N.W.—Hon. S.

St. Peter's Hospital for Stone, &c., Henrietta-street, Covent Garden, W.C.—H.S. £75.

Salford Royal Hospital.—H.P. and H.S. £200. Also Cas. H.S. £150.

Samaritan Free Hospital for Women, Marylebone-road, N.W.—H.S. £100.

West African Medical Service.—M.O. £660.

West Bromwich and District Hospital.—Res. Asst. H.S. £180.

West London Hospital, Hammersmith-road, W.—H.P.; also two H.S.'s. £100.

Winchester, Royal Hampshire County Hospital.—H.P. £150.

The Chief Inspector of Factories, Home Office, London, S.W., announces the following vacant appointments: Stowmarket, Suffolk; Kirkwall, Orkney; Maidenhead, Berks.

Births, Marriages, and Deaths.

BIRTHS.

Blackley.—On August 31st, at West Highwood, Walton-le-Dale, near Preston, the wife of F. J. Blackley, M.D., of a daughter.

Butler.—On Sept. 1st, at "Brookfields," West Kirby, the wife of G. Guy Butler, M.D., B.Ch., of Dar-es-Salaam, Tanganyika Territory, of a son.

Craig.—On August 28th, at Culmington-road, Ealing, W., to Eileen, the wife of Squadron-Leader E. W. Craig, M.B., B.Ch., R.A.F.—a daughter.

Murray.—On August 28th, at Osman House, Fortis Green, N., the wife of James R. Murray, M.D. Aberd., of a daughter.

MARRIAGES.

Bethune—Penney.—On August 13th, in London, Henry Norman Bethune, F.R.C.S. Edin., M.B. Toronto, to Frances Eleanor, only daughter of the late José Campbell Penney and Mrs. Campbell Penney, of Edinburgh.

Harvey—Millard.—On August 25th, at Marylebone, Dr. William Harvey, to Florence Elizabeth Millard.

O'Mullane—Cowie.—On August 30th, at the Church of Our Lady of Grace, Charlton, Jerome John O'Mullane, M.B., B.Ch., B.A.O. N.U.I., to Annette Isabella, eldest daughter of Dr. and Mrs. Cowie, Charlton, S.E.

Turtle—Burton.—On August 30th, at the Parish Church of S. Mary, Stansted, Essex, James Turtle, M.R.C.S., L.R.C.P. Lond., to Elaine Clara Constance, youngest daughter of Mr. and Mrs. Ernest L. Burton, of Stansted, Essex.

DEATHS.

Carter.—On August 29th, suddenly, at The Lawn, Lord-street West, Southport, Weldon Cragg Carter, M.D. Lond., M.R.C.S., L.R.C.P. Lond.

Hart.—On Sept. 1st, George Simpson Hart, M.D., of Measham, Burton-on-Trent, aged 55.

Taylor.—From heart failure after heatstroke, Alan Everley Taylor, M.A., B.M., Ch.B. Oxf., Surgeon City Line, formerly Resident Ophthalmic Officer, Leeds Infirmary, and Captain, R.A.M.C., 1914–1919.

Webster.—On August 30th, at his residence, The Avenue, West Ealing, W., Ridley Manning Webster, M.R.C.S. Eng., L.R.C.P. Edin., in his 77th year.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Comments, and Abstracts.

PUBLIC HEALTH IN ASSAM.

THE report on Public Health in Assam for 1921[1] deals only with the population of the plains districts of the province, the population of which districts is stated as 6,854,367, being an increase of 802,860 over that of 1911. (The population of the whole province (1921) is stated as 7,606,230 in Whitaker's Almanack, 1923.) The total births registered numbered 203,153, giving a ratio of 29·63 per 1000, as compared with 32·19 in 1915–19 and 31·53 in 1920; but this latter ratio was calculated on the population of the previous census, and if the 1921 ratio were calculated on that basis it would be 33·57—that is, there was really an increase in the births. In the other provinces of India the ratio varied from 27·05 in Madras to 41·50 in the Punjab (Bengal statistics are not available). In the districts of Assam the birth-rate ranged from 24·16 in Lakhimpur and 25·08 in Sibsagar to 32·30 in Sylhet and 33·58 in Goalpara. The death-rate was 26·48, against 36·17, the quinquennial average, and 27·77, the average for the pre-influenza quinquennium, 1913–17. This indicates that the public health has recovered from the after-effects of that visitation. In Sibsagar district the mortality was only 20·08; in Goalpara it was 34·02 per 1000. Cholera caused 12,829 deaths (1·87 per 1000, compared with 2·46, the decennial average). Among the rural districts Goalpara, in the Assam valley, suffered most, with a mortality of 3·66 per 1000; and after this Cachar, in the Surma valley (2·97). The largest number of deaths (5885) occurred in the populous Sylhet district (2·35 per 1000). In the towns, Gauripur (7·42), Habiganj (5·57). and Karimganj (5·27) had the highest ratios; the water-supplies in these places are unprotected and their sanitary arrangements primitive. The small-pox mortality was 0·40 per 1000, compared with 0·47 in the decennium. In the Darrang district the ratio was 2·38; the epidemic was confined to certain villages in the Mangaldai subdivision, where vaccination had been neglected. The total fever death-rate was 15·7 per 1000, as compared with 18·57 in 1920, 17·18 in the decennium 1911–20, and 14·91 in the pre-influenza decennium, 1908–17. Good results have followed on the carrying out of the Lumding anti-malarial scheme, the attacks per head per annum having been nearly halved, and the splenic index in the bazaars very largely reduced; similar satisfactory results have been reported at Pasighat. The mortality from kala-azar (2987 deaths) was somewhat higher than in 1920 (2798), and, indeed, was higher than in any previous year; but this was probably "to some extent due to an increased attention to the disease leading to a subtraction from the fever deaths and addition to the kala-azar deaths." Forty-three assistant and sub-assistant surgeons were employed on special duty, and 12 indoor hospitals, with a total of 226 beds, were open for reception of patients, in addition to accommodation in other hospitals and treatment at dispensaries; the total patients numbered 15,880. Lieut.-Colonel McCombie Young, I.M.S., Director of Public Health for the province, who presents this report, notes that "it is indeed a stimulating sight to see the troops of patients, mostly attending our dispensaries and hospitals, and voluntarily and cheerfully undergoing a treatment in which their chances of recovery are now equal to what were formerly the chances of almost certain death"; and "ventures the opinion that Government money has rarely been spent to better purpose in the saving of life and health."

The mortality from dysentery and diarrhœa was 1·68, compared with 2·37 per 1000 in the decennium 1911–20, varying from 0·33 in Goalpara district to 3·23 in Lakhimpur. There was an improvement in every district except Kamrup, where the ratio was 1·00, compared with 0·92 in the decennium. In the tea gardens the ratio was 5·25, varying from 2·30 in Kamrup to 7·21 in Lakhimpur. "Speaking generally, there is little doubt that something like half the mortality and inefficiency among the labour populations of tea estates is due to bowel complaints, and much of it is preventable by the introduction of modern methods of refuse disposal; as lack of conservancy, hookworm infestation, and bowel diseases, work together in a vicious circle to maintain the high mortality rates in question." There has been a period of financial depression in the tea industry, but expenditure in this direction, by leading to increased health and efficiency, will undoubtedly be a true economy in the end. In Sylhet district "the conservancy system suffered serious detriment as the result of a turn of municipal politics, whereby, in the name of retrenchment, nightsoil carts and animal traction were replaced by hand removal, with results that were to be expected. . . . The incident raises the question as to whether more control should not be exercised by Government over the results of the activities of municipal politicians when these are likely to endanger the health of the community." We suggest that "the answer is in the affirmative." Dibrugarh, in the Assam valley, is the only considerable town in the province now unprovided with a filtered water supply, having refused the offer when other towns were being equipped, and being still dependent on unprotected wells. No action appears to be contemplated. A sanitary inspector, now styled "health officer," has been appointed for each of the four towns of Habiganj, Sunamganj, Karimganj, and Sibsagar, as well as four rural health officers for as many local boards. It is too soon to offer any optimistic forecast as to the improvements in rural sanitation that may result, but "one ventures to hope that, when the present financial stringency disappears, it will be found possible to provide every local board in the plains districts with a health officer."

The Jail Population.

The jail population in this province averaged 2656 in 1921, as compared with 2514 in 1920. The convicts averaged 2314, an increase of 155 over the previous year, "mainly attributable to the non-coöperation movement; of the total number (4608) admitted, 1018 were for offences against the public tranquillity. There was a marked decrease in the female prisoners admitted, 78 as compared with 138 in the previous year; but there was an increase in the numbers of those who were able to read and write (5·27 per cent.), or to read only (0·41 per cent.), compared with 1·64 and 0·02 per cent. respectively in 1920; the increase was due to the non-coöperation prisoners, who mostly belonged to the educated class. "It is remarkable that prison offences are declining steadily, while the jail population is gradually on the increase"; the total offences numbered 2591, against 3030 in 1920 and 3688 in 1919. It might be suggested that this is because the standard of education has been higher. As regards the health of the prisoners, the admissions to hospital were 909·8, the average daily sick 39·5, and the mortality 35·38 per 1000; the corresponding ratios for the preceding year were 758·09, 35·77 and 25·06. It is noteworthy that the jail death-rate, which from 1915 to 1919 had been very considerably lower than that of the population of the province generally, in 1920 nearly equalled the provincial rate (25·06 compared with 28·98 per 1000), and in 1921 rose to 35·38, while the provincial rate fell to 26·48. The main cause of death was influenza, which "instead of passing in epidemic form through the jails, has been almost constantly present." Vaccine, either as prophylactic or curative, has not been successful. As compared with the jail statistics of other Indian provinces, the total Assam mortality (35·38 per 1000) was only exceeded by that in the Central Provinces (35·53); in the adjoining province of Bengal it was only 16 per 1000. By an obvious, but unfortunate, typographical error, the table on p. lxvii shows the deaths among convicted prisoners in the various jails of the province from diarrhœa as having been in a ratio of 941 per 1000.

Vaccination.

In the report on Vaccination for the three years, April, 1920, to March, 1923, it is stated that the total number of operations during this period amounted to 1,162,931, showing an increase of 77,558 on the preceding triennium. In the three years now reported on, however, the numbers were 418,936, 367,548 and 376,447, showing a considerable decrease in 1921–22, and only a very slight recovery in 1922–23; the decrease was due to the non-coöperation movement. The small-pox mortality in the province has naturally increased during the period: in 1919–20 it was 0·20 per 1000; in 1920–21, 0·24; in 1921–22, 0·35; and in 1922–23, 0·38. Where vaccination is performed the results are very satisfactory, the success ratio having been 94·91 per cent. for primary operations during the triennium, and 62·2 for revaccinations. The lymph is prepared at the Shillong dépôt, and is issued after having been kept three months in cold storage. All districts showed an increase in the number of operations, compared with the previous triennium, except Manipur State, where there was a decrease of 50,683, Kamrup (26,187), and Cachar (5096). The average number of operations per vaccinator in 1922–23 was 1108; in the Garo Hills district the average was 1652.

Mental Treatment.

In the Assam provincial lunatic asylum at Tezpur there were confined 413 patients at the end of 1920, and 105 were admitted during the year 1921. The daily average strength was 427, compared with 399 in the year preceding; 51 patients were discharged, of whom 49 were cured, and two "mentally improved." The admissions to hospital numbered 126, of which 24 were for dysentery and 15 for diarrhœa, as compared with 16 and 12 in the previous year. Colonel J. Garvie, I.M.S., Inspector-General of Civil Hospitals, who forwards this report, emphasises the dependence of dysentery on the filthy condition of the patients and site overcrowding. Of the new admissions to the asylum, 29 per cent. were in bad health and 45·3 with indifferent health on arrival. A hospital ward for dysentery cases is urgently required.

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[1] Shillong: Assam Secretariat Press. 1922.

HEALTH CONDITIONS IN CYPRUS.

A REPORT for the year 1922 has been received at the Colonial Office on the affairs of this island, situated in the eastern Mediterranean. The island is about 140 miles in greatest length from east to west, and about 40 miles in greatest breadth from north to south. The population, as shown in the census return taken in 1921, was 310,709. Public health in 1922, except for a severe epidemic of measles throughout the island, was again good, the stringent quarantine regulations in force proving effectual in preventing the introduction into the country of plague, typhus, and other virulent diseases prevalent in most neighbouring countries of the Levant and the Near East. This complete immunity is the more satisfactory when it is considered that several thousands of refugees, many of the poorest class, found asylum in Cyprus from Smyrna, Cilicia, and Asia Minor. An outbreak of small-pox, which was brought into the island by Armenian refugees from Mersina, in Cilicia, at the beginning of the year, was immediately detected and suppressed; 86 cases in all were recorded, of which 16 were fatal. Some 50,000 vaccinations were carried out. Cyprus continued to be free from rabies, and the regulations prohibiting the importation of dogs from any destination were again strictly enforced during the year. The prevailing diseases were, as in 1921, those of the digestive and respiratory system, influenza, diseases of the skin, rheumatism, malaria, and enteric fever. The anti-malaria campaign was, as usual, conducted under the supervision of the medical officer of health, though the spleen-rate, which is regarded as the index of malaria in a country, showed a tendency to rise, a circumstance attributed to the rains which fell exceptionally late in the spring and early summer of 1920 and 1921. The births registered were equivalent to 28·0 per 1000, and the deaths to 29·0 per 1000 of the population, as compared with 26·6 and 19·8 respectively in 1921. The marked increase in the death-rate is attributed to the severe epidemic of measles already referred to, which caused a greatly increased mortality among children and infants, the death-rate for the latter under 1 year being 167·6 per 1000, as compared with 130·4 in 1921. The climatic conditions generally during the prolonged summer were exceptionally exhausting, and the great heat and excessive dryness proved fatal in many cases of old age and chronic sickness. There were Government-maintained or aided hospitals in operation in the six principal towns, and 16 rural medical officers worked among the village population. The new hospital at Limasol has been opened and is now in operation. Over 1300 patients were admitted to the Central Hospital at Nicosia, which is fitted with 56 beds, and the out-patients treated numbered rather more than 8000. Some 150 surgical operations were performed. More than 18,500 persons received relief at the rural dispensaries. The number of lepers detained in the Leper Farm at the close of 1922 was the lowest on record—i.e., 69, as against 90 in 1916, and 102 in 1909. The admissions to the Farm were only five, as against nine in the two previous years, and there were nine deaths, all of which were advanced cases of the disease. Some of the inmates were treated internally with chaulmoogra oil with good results, though no actual cure can yet be reported. The beneficial effect of segregation is beginning to tell, and leprosy in Cyprus is now well in hand, hopes being entertained that it may be possible entirely to eradicate it from the island. The number of children at the close of the year in the home for the healthy children of lepers was 10, all of whom remained free from any sign of the disease. The climate of Cyprus is, generally speaking, temperate and healthy, though the excessive heat of the plains during the summer is trying to Europeans. The heat is, however, dry, except on the coast, while the winters are cold and invigorating. The absolute mean temperature for the year at Nicosia was 66·90° F., as against the average of 65·80° for the last 15 years. The mean maximum temperature was 78·60° F., and the mean minimum 55·20° F. The rainfall for the last ten years has averaged 20·09 inches per annum; in 1922 the mean for the whole island was 18·41 inches, as against 22·44 in 1921. The experience of the last decade would seem to show that the climate of Cyprus tends slowly but surely to change. While the excessive heat in the plains still prevails during midsummer the winters are colder, and late rains not infrequently fall, even up to the months of May and June, a circumstance attributed principally to the conservation and extension of the island's forests.

THE EARLY DAYS OF LETTSOM.

AN account [1] compiled from letters, diaries, and minute books of the Quaker settlement (1741–1786) in Tortola, one of the Virgin Islands, is of medical interest because in Little Jost Van Dykes, an islet off Tortola, there was born in 1744 John Coakley Lettsom. His birth was remarkable in that he is said to have been one of the seventh pair of boy twins born to his mother, of which family he and his brother Edward were the sole survivors. His father was Edward Lettsom, who owned this and sundry other islets together with a cotton plantation on Tortola. Edward Lettsom died in 1754 and his widow married again. There is an amusing entry on p. 35 giving "the Widow Lettsom's" reply to chidings for not attending meetings: "Frinds slited her and set her at noat and she being left destitute from human help not a negro to assist her. Meetings being at a distance and thinking it hard to be slited by Friends in her distress, had quit attending meeting." Slavery was at this time not considered inconsistent with the profession of Quakerism or, indeed, of any other body of Christians, but it is notable that John Coakley Lettsom, who had been sent to England to be educated at the age of 6—i.e., in 1750—returned to Tortola more or less qualified as a medical man in 1767, when his first action was to free his slaves. The book gives a most interesting picture of a phase of eighteenth-century society very little known to most people.

SUSPECTED CASES OF PLAGUE AND CHOLERA.

IN a circular (No. 437) addressed to port and riparian sanitary authorities it is stated that in several recent instances the Minister of Health has not been informed promptly of the occurrence of suspected cases of plague on ships arriving in ports in this country, and there has also been delay in forwarding to the Ministry for bacteriological investigation material obtained from such cases. The Minister reminds sanitary authorities that under the International Sanitary Convention of Paris, 1911/12, the Governments of all countries participating in the Convention must immediately be notified by H.M. Government of the occurrence of any case of plague or cholera in this country, and it is therefore of the utmost importance that every suspected case of plague or cholera should at once be reported to him. Material from such cases, if obtainable, or from rats suspected to be suffering from plague, should, as soon as practicable, be forwarded to the Ministry for bacteriological investigation. Directions for the taking and transmission of such material have been forwarded to the port medical officers of health.

CODE WORDS FOR MEDICAL TELEGRAMS.

To the Editor of THE LANCET.

SIR,—May I make a small contribution to the possible ambiguities arising in reports of pathological findings? I found the following message on my slate when I came in the other day:—

"They rang up from the hospital to say the telegram has come through, that the swab from the throat is *maggoty* in the boy Smith."—I am, Sir, yours faithfully,

East Grinstead, August 28th. W. HENRY HILLYER, M.D.

*** The Post Office has recently replaced the word *negative* in code telegrams by *not found*.—ED. L.

"WHY AND WHETHER IN FIRST AID."

THIS useful little book (London: John Bale, Sons, and Danielsson, Ltd. 1923. Pp. 100. 1*s*.) was first prepared nearly ten years ago to explain the difficulties in first-aid raised by a large ambulance class, the author successfully putting himself in the position of the student who asks the question. The call for a fifth edition has now enabled Dr. N. Corbet Fletcher to answer a number of queries suggested by correspondents or necessitated by changes in the St. John Ambulance Association text-book. It can hardly fail in its present form to advance the efficiency of first-aid work.

AN INTERCEPTOR FOR DENTAL FOUNTAIN SPITTOONS.

AT the suggestion of Mr. Peyton Baly, M.R.C.S., L.D.S., I have designed a metal box 4 in. by 3 in. by $1\frac{1}{2}$ in., having at one end an inlet elbow-joint with sliding standardised nut for attachment to the cuspidor and upon the under-surface an outlet tube with perforated cover. A perforated removable framework of the same shape as the box, but of smaller dimensions, rests within the apparatus, and is enclosed in one of the surgical napkins used by dental surgeons. As the fluid from the bowl of the cuspidor streams into this receptacle it is filtered both by the small perforations of the metal and by the napkin before it passes through the perforated cover of the outlet. Sputum and other rapidly decomposing material is thus prevented from lodging in the rubber waste-pipe which, as now employed, acts as a trap for this material—a fact well known to those who have attempted to cleanse it by pushing a cork of the same diameter as the bore through it. The box can be easily cleansed by raising the lid and removing the internal fittings. At the end of the day the outlet tube may be closed by the supplied stopper and the box filled with a disinfecting fluid, or the entire instrument may be removed and sterilised by boiling. The need for some such device has long been felt by dental surgeons. The attachment is supplied by dental depôts.

Liverpool. R. M. CAPON, L.D.S.

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[1] Tortola. By Charles F. Jenkins. London: Friends' Bookshop. 1923. Pp. 106. 5*s*.

Some Researches
INTO THE PHYSIOLOGICAL PRINCIPLES UNDERLYING THE TREATMENT OF INJURIES AND DISEASES OF THE ARTICULATIONS.*

A Lecture delivered before the Physiological Society of the Middlesex Hospital

By A. G. TIMBRELL FISHER, *M.C.*,
F.R.C.S. ENG.,

LATE HUNTERIAN PROFESSOR, ROYAL COLLEGE OF SURGEONS (ENG.), 1921 AND 1922: SURGEON (WITH CHARGE OF OUT-PATIENTS) AND JOINT LECTURER IN OPERATIVE SURGERY, SEAMEN'S (DREADNOUGHT) HOSPITAL, ETC.

AT the present time the need for research into the physiology of the articulations is urgent; it is my desire to awaken interest and enthusiasm in these difficult and important problems, and my hope that others may be induced to attack them.

Why are these problems important? Because very many stiff and deformed joints might have been prevented by a knowledge of physiological principles; moreover, the restoration of movement to the crippled joints is often possible. The science of manipulative surgery is as yet in its infancy. It is folly to shut our eyes to the fact that in many cases the unqualified bone-setter achieves brilliant results. Hard-headed business men who are directors of football teams often send a professional footballer to an unqualified bone-setter as a last resort. The latter performs certain manipulations and the player is frequently able straightway to resume his professional football, although failures may occur.

Let us be honest, and, instead of decrying the good work done by the bone-setter, conduct research into the underlying physiological and pathological principles. We may rest assured that the mists of ignorance will be dispelled when we adopt the method that John Hunter advised to his friend Jenner, who was thinking of investigating vaccination: "Do not think, but try; be patient, be accurate." It has been truly said that the progress of any particular branch of medicine or surgery from empiricism towards the status of a science depends upon an observance of three great principles or foundation stones—accurate anatomical, physiological, and pathological knowledge.

One of the best examples of the truth of this statement is afforded by the advances of late years in the diagnosis and treatment of tumours and other affections of the central nervous system—advances largely due to anatomical research and to physiological experiment, and to observing the precepts and teaching of that great surgeon and physiologist, John Hunter. In the march of progress certain branches have lagged somewhat behind, none more than the branch which deals with the articulations. The Hunterian tradition has been unaccountably neglected, and it is strange that although injuries and diseases of the joints are amongst the commonest of all human ailments, yet there is not only apathy, but also much ignorance of the underlying anatomical, physiological, and pathological factors.

Is there any type of case which the practitioner finds more puzzling and difficult than an obscure affection of a joint? The diagnosis presents often a most difficult problem, as may also the question of treatment. Apart from minor problems, one of the principal questions that the practitioner must ask himself is, "Shall I, in the treatment of this joint case, immobilise, or shall I permit and encourage movement?" If one may attempt a generalised statement, we may perhaps admit that the practitioner errs too often on the side of immobilisation, and hence the far too many deformed and stiff joints that we encounter daily. The bone-setter who employs movements almost as a routine perhaps errs by neglecting rest when this is indicated. However, the bone-setter is fully alive to a great principle which was summed up by a famous French surgeon in the phrase "movement is life"—a phrase which I should like to see framed in letters of gold in the consulting room of every medical man.

A stiff joint is an affliction, one which the public rightly holds in great dread. The speed and skill of the athlete, the grace of the dancer, the power of the musician to charm our ears, indeed, our daily avocations and amusements, all depend very largely upon the smooth and free gliding of cartilage-clad articular surfaces. Can we wonder that when the public are asked to choose between indiscriminate movement by a bone-setter and immobility, which is, alas, often equally indiscriminate, by a qualified practitioner, it not infrequently consults the former? In my own practice I have constantly been faced with the difficuty of deciding which mode of treatment to adopt. It became clear to me that there was an almost complete absence of guiding physiological principles. Is it surprising, therefore, that in the absence of these guiding principles we find that unqualified individuals exist who reap a harvest in the stiff and deformed joints, often due to unfortunate treatment by our professional brethren? The physiology of the joints presents many interesting and important problems, but time will permit me to deal this evening very briefly with two aspects only—viz., the physiology of articular cartilage and of synovial membranes, together with some general principles of treatment.

ARTICULAR CARTILAGE.

In articular cartilage we have a tissue well suited for studying the behaviour of cells under different conditions, since, save in the perichondrium near the edge, it contains no blood-vessels or nerves to complicate the cellular reactions. It, oddly enough, has been rather neglected by the researchers into the cause of tumours, but I believe that it may furnish much light into this difficult problem, particularly as the irregular proliferations which it undergoes in osteo-arthritis are, I believe, intermediate between inflammation and new growth. When investigating such a complicated and difficult problem as tumour formation, it behoves us to begin at the bottom of the ladder, and to study first the simpler forms of cell proliferation such as we see in repair and inflammation. Next we must study with great care the irregular proliferations that occur in certain diseases of known toxic or microbic origin. We shall then see that all these forms of cell proliferation merge gradually into one another, and it may gradually dawn upon us that it is unjustifiable to draw sharp lines of demarcation between them.

Articular cartilage is a substance well adapted for the functions that it performs. It has in health a smooth surface, lubricated by the synovial fluid, thus reducing friction to a minimum. It is of great strength and is elastic, yielding to blows and concussions which might otherwise damage the subjacent bone. Indeed, we may regard bone as a tissue less endowed with vitality than articular cartilage. For when the latter is destroyed by chronic disease, and pressure is still permitted, the bone becomes absorbed. In a Hunterian lecture on loose bodies in joints,[1] I demonstrated that in detached portions of the articular surface which contain both cartilage and bone, and which have been for some time quite free in the joint cavity, the cartilage cells usually retain their vitality, whereas the majority of the bone cells die. This observation has recently been confirmed by Ito, working in the laboratories of University College Hospital. Kuttner's cases of joint transplantation are of particular interest, as in two of them the joints were examined some time afterwards, the patients having died from an intercurrent affection. Microscopic examination showed survival of the articular cartilage, whereas the bone cells were dead.

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* The expenses of this research were defrayed by a grant from the Medical Research Council.

[1] British Journal of Surgery, 1920-21, viii., 493.

Axhausen's animal experiments showed practically the same state of affairs; the articular cartilage of the transplanted joint-end lived, whereas most of the cells of the compact bone were necrosed. No true tumours of articular cartilage have been described, and when a malignant growth of the adjacent bone reaches the articular cartilage it is a remarkable fact that the latter forms an almost impenetrable barrier, at any rate for a long period. Can we resist the conclusion that this absence of blood-vessels plays an important part in its immunity from tumour formation? This absence of tumour formation where vessels are non-existent leads us to inquire whether the irregular proliferation of cells that we call tumours may not be due to irritant or toxic substances brought to the selfsame cells through the intermediation of the circulation. I have found experimentally that it is possible to produce small tumours of the lateral part of the articular cartilage by radium.

Experiment 20.—A small glass tube containing 0·0382 mg. radium was introduced into the left knee of a rabbit and fixed by suture against the inner border of the internal femoral condyle near its junction with the trochlear surface. A similar tube but containing 0·15 mg. radium was introduced into the right knee and fixed in a similar position. Nineteen weeks later the animal was killed and the following appearances were noted:—

Left knee: Well-marked proliferation of the articular cartilage at the inner margin of the femoral condyle and trochlear surface. The radium tube had become loose and lay in the supra-patellar pouch.

Right knee: Slight and irregular nodular chondro-osteophyte in same position as in left knee.

It is important to note that the greater amount of proliferation occurred in the left knee—which, however, had contained the smaller amount of radium. I am indebted to Prof. W. S. Lazarus-Barlow for the kind loan of the radium tubes.

Structure of Articular Cartilage.

It will perhaps avoid confusion if we discuss the structure of articular cartilage under two headings—viz., the central and the lateral articular areas. I have endeavoured to show that there is a fundamental difference between the structure and nutrition of these two parts and that this difference is of importance, since it sheds light upon many hitherto obscure pathological phenomena.

Central Articular Area.—It was held by Ogston that the surface cells are degenerate and are in process of being shed into the joint, and that articular cartilage is continually renewing itself by growth of the intermediate zone. Henle has described a delicate layer of cells upon the free surface. If, however, the surface of the *central part* of the articular cartilage be carefully focussed, it will be seen that there is no layer of cells at the actual free surface, but that this is formed of clear matrix with a sharp curvilinear margin. Secondly, the more superficial cells of the articular cartilage, which are flattened conformably with the surface, show no sign of degeneracy and have every appearance of being normal healthy cells. There seems little doubt, not only from analogy with the lateral part of the articular cartilage, but from developmental reasons, that these more superficial cells are the source of origin of the deeper cells and that they behave like the perichondrial cells of costal cartilage. Towards the termination of the second month, the joint cavities have appeared—a split occurring in the mesenchyme. At the fourth month of intra-uterine life the surface of the joint cartilage is still covered by this layer of connective tissue. This is the stage found throughout life in certain birds. With the increasing movements of the child before birth the perichondrial layer gradually recedes from the more central parts of the articular surface, but at birth it still strays for a short distance over its edge. Microscopically, however, the connective-tissue layer can be traced beyond the naked eye delimitation. Shortly after the child begins to walk the extension of the synovial membrane over the lateral margin of the articular cartilage makes a further slight regression, but soon assumes its permanent relationship. No perichondrium is present over the more central part, yet there can be no doubt from a study of their structure, staining reactions, and of their development and comparative anatomy, that these cells have the same function as the perichondrial cells of the lateral part of the articular cartilage, and are the parent cells of the more fully-developed cartilage cells in the deeper parts. In the intermediate zone of the articular cartilage the cartilage cells are arranged in groups and are no longer flattened. In the deeper zone the cells are arranged in columns perpendicular to the narrow subarticular layer of bone upon which they lie.

Lateral Articular Area.—This closely resembles those forms of hyaline cartilage, such, for example, as costal cartilage, which are furnished with a perichondrium, for the synovial membrane gives to this part of the articular cartilage a delicate investment in which well-marked capillaries may be traced. At the edge also the articular cartilage is fibrillated and partakes of the nature of fibro-cartilage. This difference in structure of the central and lateral parts is rendered clear, as we have seen, by a study of the development of a joint and by comparative anatomy.

Nutrition of the Articular Cartilage.

In a paper which has become classical, entitled "Of the Structure and Diseases of Articular Cartilage," William Hunter first described the circulus articuli vasculosis lying near the articular edge and giving delicate offshoots to the lateral part of the articular cartilage. Toynbee did not attach much importance to the circulus as a source of nutrition, but considered that articular cartilage derived its pabulum from plasma exuded from the capillary loops lying in the cancellous spaces beneath the subarticular layer of bone. The synovial fluid has not hitherto been seriously considered as a source of nutrition, but Strangeways, arguing from the increase in size that loose bodies derived from the articular surface undergo while free in a joint, has advanced the view that the synovial fluid is a normal source of nourishment of the articular cartilage. Thus we are faced with three different theories. My own observations lead me to believe that there is an element of truth in each. By delicate injection methods, the subarticular bony layer is seen to be freely permeable by the injection matter, and it is probable that nutrient plasma is also able to permeate this zone and nourish the deeper layer of the cartilage. Laterally the subarticular layer is actually penetrated at certain spots by blood-vessels which can be traced for short distances in the cartilage.

With regard to the rôle played by the synovial fluid, we are faced with the fact that there is no evidence that the analyses hitherto recorded are of fluid obtained from normal joints. Indeed, evidence derived from the data given, with the few analyses hitherto recorded, points to the fact that the fluid was derived from pathological conditions such as synovitis with effusion. Such inflammatory effusions have a somewhat high protein content. The analysis of normal synovial fluid collected by myself in the post-mortem room gave results of considerable interest and may be summarised in the form of a table.

Average Personal Cases.

—	Synovial fluid percentages.		Lymph plasma percentages. Human.
	Human.	Oxen.	
Total solids ..	4·41	2·023	4·2–6·5
Protein content ..	1·6	0·92	3·5–4·3
Mucin	1·95	0·1303	—

In spite of the somewhat low protein content shown in the table, I believe that the synovial fluid nourishes the superficial cells of the central articular area; and this same low protein content accounts for the feeble powers of resistance of this part of the articular cartilage and the readiness with which it undergoes degenerative changes, and the extreme slowness or even absence of repair in the central part of the articular cartilage. I found by systematic examination of joints from the post-mortem room that 80 per cent. of individuals between 50 and 60 years of age and 90 per cent. between 60 and 70 show more or less of fibrillation of the central part of the articular area.

I believe that the deeper layer of the articular cartilage is nourished from the capillaries in the subarticular cancellous spaces, and that the lateral part of the articular cartilage receives in addition a supply of lymph from the capillaries of the circulus articuli vasculosus.

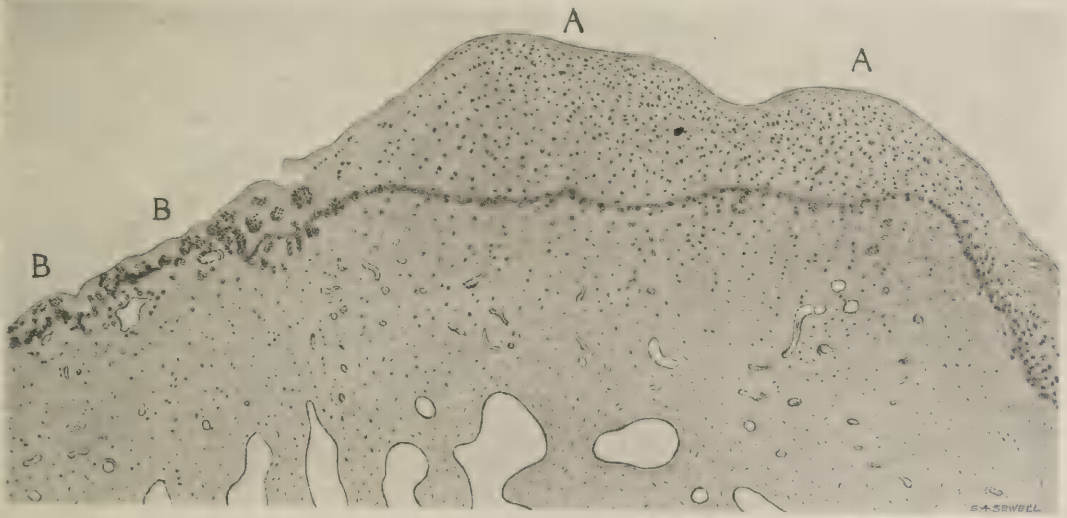
Repair in Articular Cartilage.

The phenomena of repair are a striking confirmation of the views enunciated above. I have confirmed Redfern's experimental findings that incisions in the central part of articular cartilage heal, if at all, with great sluggishness, and that there is an absence of cartilaginous repair. Incisions in the lateral portion, however, exhibit much more active repair, and there is a new formation of articular cartilage in which both cartilage itself and perichondrium participate.

Experiment 18.—A transverse incision was made in the trochlear surface of the femur of a rabbit and through the whole thickness of the articular cartilage. Seven and a half months later the animal was killed, and microscopic examination (Fig. 1) showed little if any sign of repair. It will be seen that the articular cartilage to the right of the incision has undergone necrosis and is being invaded by multinucleated chondroclasts.

This difference is even more markedly demonstrated when the articular cartilage is completely removed with exposure of the subjacent cancellous spaces. Laterally a pannus of granulation tissue derived from the synovial membrane and supplied by the circulus spreads over the denuded zone and assists in forming new cartilage. In the central areas the formation of new cartilage is less marked and occurs through the agency of the connective-tissue cells of the exposed cancellous spaces. In the experiment mentioned above the inner portion of the femoral condyle was chiselled away, leaving a flat surface of cancellous bones. The microscopic appearances as seen seven and a half months later are shown in Fig. 2. On the left side of the drawing may be seen a feeble attempt at new cartilage formation from the exposed cancellous spaces. In the centre and on the right there is an exceedingly marked formation of new cartilage which is largely derived from the perichondrium upon the surface. In addition to its nutritional duties we may therefore regard the circulus articuli vasculosus as a very important factor in the destruction and replacement of diseased cartilage and in the repair of deficiencies in its lateral part. It is the vascular supply of the pannus of granulation tissue which spreads like an advancing tide over the surface of the cartilage in many forms of arthritis.

FIG. 2.

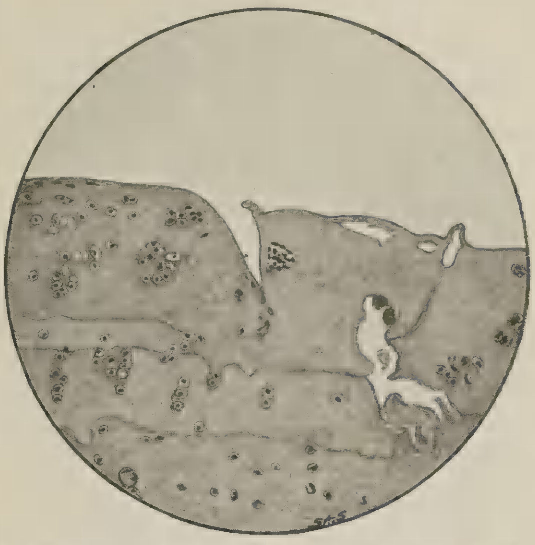


Portion of lower end of femur of rabbit 7½ months after articular cartilage had been chiselled away, with thin layers of subjacent bone. AA, marked reparative formation of new cartilage laterally. BB, feeble formation of new cartilage in the more central zone. Obj. 2/3 in.

Compensatory Proliferation of Lateral Part of Articular Cartilage after Destruction of Central Part.

This fact, which I was able to demonstrate experimentally,[2] forms in my opinion one of the most striking examples of adaptation in the human body, and it seems clear that the "lipping" that occurs in osteoarthritis, particularly the traumatic type, is an attempt by the better nourished lateral portions to compensate for the loss of the central parts *by extending the articular surface.* This view, although it may savour of metaphysics, I believe to be of great importance, for it is clear that, if aided by judicious treatment, these osteophytes may play a useful part, and their indiscriminate removal when causing no obstruction to movement is to be deprecated.

FIG. 1.



Experiment 18 (rabbit). Incision in centre of articular cartilage of trochlear surface of femur after 7½ months, showing absence of repair. Obj. 1/6 in.

I have endeavoured to show that the loss of the central articular cartilage may be due to trauma or to the action of toxic or poisonous substances, and that in the latter case the same toxins may cause degeneration of the poorly nourished central portion of the articular cartilage and proliferation of the better nourished lateral parts. The term toxin is to be used in its broadest sense, and there is evidence that these toxins may be bacterial in origin. There is, however, a danger of emphasising the importance of bacteria in the ætiology of disease. The occurrence of osteo-arthritic changes in certain disorders of the ductless glands, and its frequency at the menopause, certainly suggest that the toxins are due to failure of a ductless gland or glands to supply some links in the chain of metabolic endogenous products, or that possibly by this same failure the resistance of the patient to infection may be thereby lowered. There is evidence also that osteo-arthritis may be due to auto-intoxications such as those due to defects in the excretory apparatus or the accumulation in the body of products of normal or abnormal metabolism.

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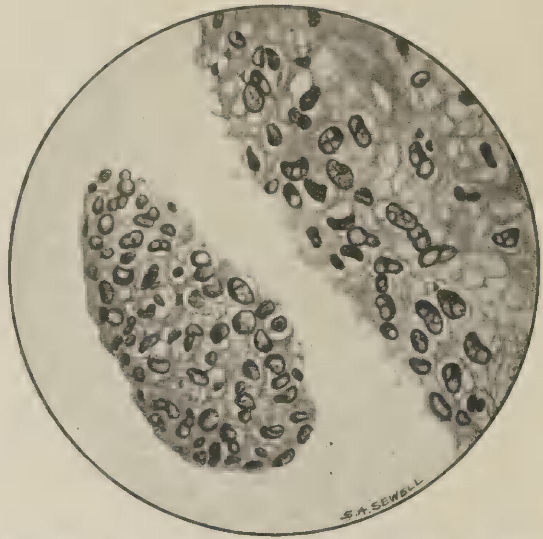
[2] Hunterian Lecture, British Journal of Surgery, July, 1922.

FIG. 3.



Synovial membrane from a case of chronic synovitis showing active mucinogenesis in synovial cells. On the left a villus is seen in transverse section. Obj. 1/12 in.

Mode of Access of Nutrient Fluid to Cartilage Cells.

No definite lymphatics with endothelial lining have ever been demonstrated in articular cartilage. How, then, do the cartilage cells obtain their nourishment? The intercellular material of articular cartilage is composed of mucin and collagen in various proportions. If articular cartilage is stained by carbol-thionin, which stains mucin pink, it will be found that the zone of matrix immediately surrounding the cell groups is stained deeply and is evidently the most recently formed and more mucinous part. On examination of a well-stained section the pink zones branch and communicate and form a network surrounded by a series of more faintly stained zones evidently formed of collaginous matrix. In the superficial area the layers are horizontally arranged, and in the deeper zone the arrangement is vertical. If articular cartilage is steeped in brine, these layers become prominent, and if it be fractured at right angles to its surface, the arrangement in perpendicular fibres like the pile of velvet is very striking. There is strong evidence from the nature of the earlier changes in osteo-arthritis that there is a solution of these same mucinous paths and that the fibrillation is due to the persistence of the columns of more collaginous matrix.

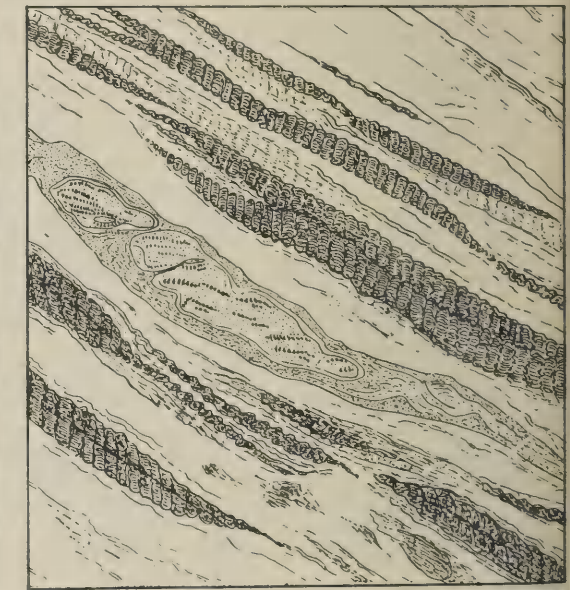
PHYSIOLOGY OF THE SYNOVIAL MEMBRANES.

It is quite impossible in the time at my disposal to give more than a brief summary of my researches into the structure and functions of the synovial membranes. I find that this membrane differs markedly in its structure at different situations in the same articulation. At the parts most remote from the articular edges it consists of a single layer of endothelial-like cells which in places surround openings or stomata. Beneath the endothelial layers is a layer of loose connective tissue rich in capillaries, nerves, and lymphatics. Here and there the endothelial layer is absent, and at these spots the loose connective-tissue layer abuts directly upon the joint cavity. This absence of a complete endothelium may account for the grave toxæmias of acute suppurative arthritis.

Nearer the articular margins the endothelial layer is very deficient, as it is also at the margins of the villi—the latter being almost exclusively confined to the portions of the membrane nearest to the articular margin. The most striking feature of the membrane in the latter situation and in the villi is the presence of great numbers of deeply staining, oval or round, connective-tissue cells, which may form superimposed layers. The nuclei of these cells are spherical or oval and of the reticulated connective-tissue type. The function of these cells appears to be the secretion of the synovia, and the absence of a complete endothelial layer readily allows the synovia, assisted by the joint movements, to escape into the joint. On staining synovial membranes with carbol-thionin (Fig. 3) I discovered globules of mucin in the cell bodies, and every stage of transition between well-marked granules and definite droplets of mucin may be seen. In some cases the cell can be seen to be distended with mucin and the nucleus compressed.

I believe that the mucin gains the joint cavity in three distinct ways: (*a*) The cells at the surface discharge their mucin into the joint cavity. (*b*) Certain of the deeper cells discharge their mucin into the loose connective-tissue spaces of the villi, whence it is squeezed out by the joint movements. (*c*) In chronic synovitis, and possibly in normal joints, portions of the surface layer of the membrane are detached and the mucinous transformation takes place in the joint cavity; the cell bodies forming the cellular débris normally present in the synovial fluid. In some, cartilaginous transformation can be seen to be taking place.

FIG. 4.



End-bulb of nerve between tendon fibres attached to patella. (Drawn by Dr. R. J. Gladstone.) Obj. 1/6 in.

The membrane surrounding certain fatty processes projecting into joints, such as the infra-patellar pad of fat, is so richly furnished with these secreting cells that the name "synovial glands," originally given to them by Clopton Havers, seems amply justified. There can be little doubt also that, as Havers suggested, the pressure caused by the normal joint movements causes an increased outpouring of mucin. This fact was proved by Freidrichs, who examined the synovial fluid of oxen after rest and after exercise. Whether there is, in addition, a nervous mechanism, it is impossible at present to state. That this is the case is, however, suggested by the interesting condition of intermittent hydrathrosis. In addition to the power of secreting mucin, which is a pure lubricant, we must not forget that the synovial membrane allows the transudation from the rich plexus of capillaries with which it is supplied of the albuminous fluid which, in my opinion, nourishes the central superficial area of the articular cartilage. It is not generally realised that the synovial membrane is richly supplied with nerves. By special staining methods I have observed delicate nerve fibrils forming a plexus in the sub-endothelial layer, also a further plexus immediately beneath the secretory layer of cells. Connecting these two plexuses are delicate fibrils, and in certain of the villi I have observed end bulbs (Fig. 4). Nicoladoni described Pacinian capsules in the articular capsules in the rabbit. I have observed similar bodies in man in the anterior wall of the supra-patellar pouch lying immediately beneath the synovial membrane. It is highly probable that many of the nervous phenomena that occur in certain joint diseases, particularly in rheumatoid arthritis, are reflexly produced and are caused by inflammatory involvement of the synovial nerves and nerve-endings. These nervous phenomena are often so prominent that by many the disease is considered primarily "neurotrophic" in nature, but it seems more probable that the vasomotor and articular symptoms are due to the action of some common cause.

Physiology of Absorption by the Synovial Membrane.

That master physiologist, Claude Bernard, wrote in 1859 with regard to the synovial fluid, "les données physiologiques sur ce liquide sont à peu près nulles: le siége anatomique de sa sécrétion est lui-même très peu connu." These words are well-nigh as true to-day as when they were written more than 60 years ago, and otherwise exhaustive treatises on physiology dismiss the subject in a few lines as one of no importance or interest. The behaviour of the synovial membrane towards various fluids differs considerably with the chemical and physical composition of the latter. In this part of my research I have received helpful suggestions from Dr. Bolton, whose work on absorption from the peritoneal cavity is well known. I propose here merely to recite a few typical experiments.

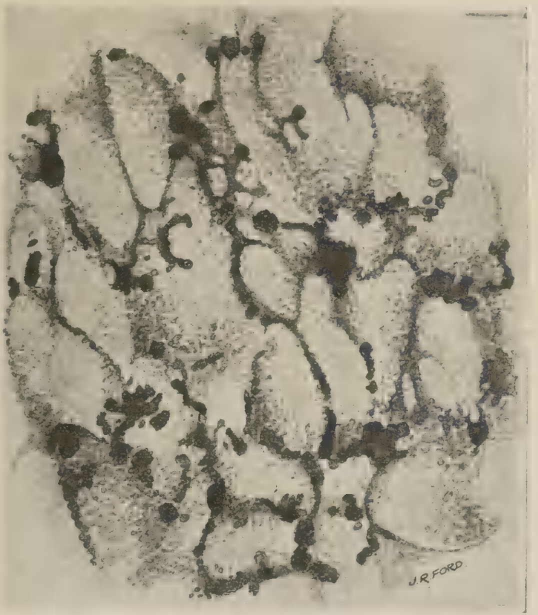
Absorption of Isotonic Solutions.

Experiment 6 (old series).—In this experiment I was kindly assisted by Prof. S. G. Shattock. The needle of a 5 c.cm.; syringe was inserted obliquely into the inner side of the supra-patellar pouch of an anæsthetised rabbit; 1·5 c.cm. of a sterile solution of isotonic potassium iodide was then slowly injected until the joint became tense. Absorption appeared sluggish at first, but, after alternate flexion and extension of the joint, which was repeated several times, there was appreciable slacking of the joint tension. Sufficient fluid was then injected again to distend the joint cavity. The experiment was continued for five hours, and at intervals of 15 minutes 1 c.cm. of the solution was introduced. The total amount of isotonic potassium iodide absorbed during this period was about 20 c.cm. Urine collected from the bladder at the termination of the experiment gave the typical starch reaction, showing that the potassium iodide solution had been absorbed by the synovial membrane and finally excreted by the kidney. The experiment also demonstrates the important part played by movement in assisting the absorption of the fluid. It is obvious that this process of absorption might have occurred by means of either the capillaries or lymphatics, or possibly both may have played a part. A further series of experiments was performed in an endeavour to ascertain the respective part played by these different elements. These experiments are as yet incomplete, but it is possible to state a few preliminary observations.

Absorption of Diffusible Dyes.

Experiment 9 (old series).—The above experiment was repeated, using a solution of Berlin blue; 2 c.cm. were injected into the joint, gentle movements were instituted, and after a short interval a further 1 c.cm. was injected. At the completion of the experiment the animal was killed and the joint opened and examined. A small quantity of the Berlin blue solution remained in the joint. There was a generalised diffuse staining of the membrane present, more marked in the supra-patellar pouch. On further examination it was seen that the dye lay in the sub-endothelial layer of the membrane, but no injected lymphatics could be detected either proximal or distal to the joint. Microscopic examination of a portion of the membrane from the supra-patellar pouch showed an absence of lymphatic injection save at one small area. This experiment would appear to point to the fact that diffusible dyes are somewhat rapidly absorbed by the capillaries into the venous circulation and only to a slight extent by the lymphatics.

FIG. 5.



Demonstration of lymphatics of synovial membrane by injection of colloidal silver into knee-joint of a living rabbit. The lymphatic glands along the iliac vessels and abdominal aorta also strikingly demonstrated. Obj. 1/6 in.

Absorption of Colloidal Dyes of Greater Molecular Composition.

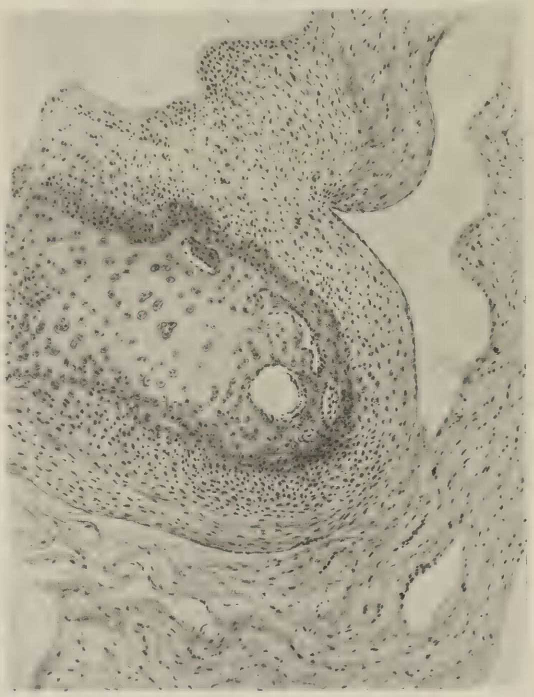
(*a*) *Berlin Blue and Mucilage of Tragacanth. Experiment 1* (new series).—A saturated aqueous solution of Berlin blue mixed with an equal quantity of mucilage of tragacanth was prepared to approximate as closely as possible to the composition of normal synovial fluid; 1·5 c.cm. were injected into the knee-joint of a rabbit; the animal was allowed to move freely about, and was killed in five hours. It was found that absorption by the lymphatics had certainly taken place, for microscopic examination of the membrane revealed these clearly. No obvious staining of the lymphatic glands was detected. The striking thing, however, was that the whole of the circulation of the animal was stained a vivid blue, showing that absorption by the capillaries had readily occurred.

(*b*) *Colloidal Silver. Experiment 4* (new series).—Adopting a suggestion of Dr. Bolton, a solution of 2 per cent. colloidal silver in normal saline was injected into both knee-joints of a rabbit. The animal was allowed to move about freely until killed five hours later. The synovial lymphatics were thus demonstrated in a very striking manner (Fig. 5) the colour varying from dark brown to black. Furthermore, the popliteal gland, the lymphatics along the course of the femoral vessels, the iliac glands, lymphatic vessels along the course of the abdominal aorta, and even glands near the entrance of the thoracic duct, were demonstrated. There was a certain amount of absorption into the general circulation, but it is not possible at present to state whether this was due to absorption of colloidal silver by the synovial capillaries directly into the blood stream or whether the silver had gained access to the circulation through the thoracic duct. It is probable that both occur, but that in the case of such colloidal substances the principal route of absorption is through the lymphatics.

I was able to prove experimentally that movement, as in the case of the isotonic solutions and diffusible dyes, plays a very important part in the absorption of colloidal silver.

In another series of experiments a similar quantity of colloidal silver was injected into the knee-joints of two rabbits. In one rabbit the joint was immobilised, whilst the other was allowed to move freely about. At the end of a fixed period of time both animals were killed. It was found that in the immobilised joint the lymphatics in the synovial membrane could usually be demonstrated, but no proximal lymphatics or glands were stained. In the case of the animal in which movement had been permitted, the proximal lymphatic vessels and glands were demonstrated by the colloidal silver in a very beautiful manner. As an instance the following experiment may be quoted.

FIG. 6.



Transverse section through experimental loose body after 7½ months. The difference between the original cartilage and that formed upon it by the synovial membrane which surrounds it is very striking. Obj. 2/3 in.

Experiment 5 (new series).—Rabbit B: 1·25 c.cm. of colloidal silver (2 per cent. in normal saline) injected obliquely into supra-patellar pouch of right knee at 10.30 A.M. No obvious extravasation occurred and puncture was sealed with collodion gauze. The animal was permitted to move about freely on recovering from the anæsthetic and was killed at 12.8 P.M.

Rabbit A: Similar injection made into the right knee at 10.50 A.M., but animal was kept under anæsthetic and no movement occurred. It was killed at 12.28 P.M.

Post-mortem examination: Diffuse staining of synovial membrane present in the injected knee of both rabbits. In Rabbit A no lymphatic glands or lymphatics proximal to the joint were stained, whereas in Rabbit B, in which movement had been permitted, the popliteal gland was stained a dark brown, the iliac glands on the right side were stained a light brown, and there were a few faintly stained lymphatics along the abdominal aorta.

The practical lessons that these preliminary experiments appear to teach will be touched upon later. I am indebted to Prof. Shattock for verifying the presence of lymphatics in microscopic preparations of the synovial membrane.

Behaviour of the Synovial Membranes towards Foreign Bodies.

In some previous experimental work upon the loose bodies occurring in joints I found that a detached portion of the articular surface almost invariably became attached to the synovial membrane, and that the latter surrounds it with a connective-tissue sheath. This sheath has, however, a very remarkable quality. It has the power of laying down layer upon layer of cartilage (Fig. 6) and even bone upon the surface of the body, until, occasionally, veritable tumours are formed. In many cases these bodies may later become detached from the membrane and continue their growth while quite free in the joint and deriving their nourishment from the synovial fluid. The nutritive value of the latter is, however, often increased by inflammatory exudate.

An enormous literature has developed concerning loose bodies in joints. Moreover, they have been a pathological puzzle for many generations. I may humbly claim to have been the first to attack the problem from the experimental point of view, and I was gratified when a Japanese investigator, Dr. Ito, working in the laboratories of University College Hospital Medical School, confirmed my experimental findings two years later.

SOME APPLICATIONS OF THE ABOVE PHYSIOLOGICAL PRINCIPLES TO TREATMENT.

1. *The Rôle of Rest.*

It may be considered an axiom that Hilton's dictum, "Rest inflamed structures," should be applied to most cases of acute inflammation affecting a joint. There are, however, certain reservations to be dealt with below. We must, in addition, constantly bear in mind that the function of a joint is movement, and that Nature's method of cure is by ankylosis and often ugly deformity. The policy of leaving the matter entirely to Nature is heartily to be deprecated. Deformity must be prevented by extension or other methods which prevent that spasm in which the powerful groups overcome the weaker and cause deformity. The limb should be placed, as Sir Robert Jones has so often pointed out, in that position which, should ankylosis occur, is of the best functional advantage to the patient, whose occupation and amusements should, moreover, be carefully considered.

We are too often apt to rest content with such ankylosis, but by instituting earlier movements very cautiously and gently when the acute symptoms are subsiding we may be able to retain a useful degree of movement. This does not, however, apply to tuberculous arthritis. The risk of lighting up the disease and of general dissemination is so great that, except in certain very chronic forms, absolute immobility of the joint should be maintained for several months after all acute symptoms have subsided. Even in these cases, however, by suitable treatment our ideal of a movable joint may be obtained where advanced destruction of articular surfaces has not occurred. In the non-infective types, such as traumatic synovitis, sprains, &c., a combination of rest and skilfully applied movement is of great advantage. For instance, in a case of traumatic synovitis of the knee rest in bed or on a couch to avoid weight-bearing and undue irritation is advisable at first; but massage and gentle movements not only allay pain but cause the more rapid absorption of intra-articular effusion and prevent subsequent stiffness. This is combined with elastic pressure and firm bandaging over a thick layer of wool completely surrounding the joint. In a case of severe sprain of the wrist rest from active use of the joint and of the hand is indicated at first, but massage and gentle passive movements may be instituted at once.

2. *The Rôle of Movement.*

(*a*) *Acute Inflammations of Joints.*—The rôle of movement in acute inflammations of joints is naturally a limited one. In cases where the articular cartilages have been destroyed the pain and spasm produced by even the slightest movement are so intense that it is ruled out of practical politics. Furthermore, there is serious risk of general dissemination. However, in cases where the suppuration is largely limited to the synovial membrane excellent results may accrue, if free drainage is provided. The pioneer work of Willems is of interest in this connexion. I recall a case of suppurative arthritis of the knee-joint, treated thus during the recent war, which I have been able to follow up. Two long lateral incisions were made for drainage, and the posterior compartment of the joint was also opened up by lateral incisions in the popliteal space, through which the joint cavity was periodically irrigated with eusol. In spite of every care the patient's condition deteriorated, and it became obvious that unless the recognised alternative of amputation was performed his life was in jeopardy. I determined to try the effect of movements of the joint. Although these were of necessity painful, the condition was explained to the patient and he loyally and intelligently coöperated. At the first movement there was a gush of pus from the drainage sites, and this was noticed at each subsequent movement. The patient recovered with a full and painless mobility. I had an opportunity of examining him a few months ago. The joint appeared perfectly normal, and to demonstrate its excellent function he hopped round my consulting-room on the previously affected limb. If this case had been treated in the recognised manner it is certain that amputation would have been necessary. It seems clear that the rationale underlying this treatment depends not only upon the prevention of ankylosis but upon the improved drainage that occurs. During flexion and extension certain synovial recesses are compressed and others cease to exist, and the pus, taking the line of least resistance, escapes via the openings for drainage. If the latter did not exist there would undoubtedly be risk of diffusion of the septic material along intermuscular planes.

(*b*) *The Rôle of Movement in Chronic Non-tuberculous Arthritis.*—It is difficult to have a better example of the principles we have enunciated than in the treatment of those exceedingly common diseases of the joints, osteo-arthritis and rheumatoid arthritis, or, as I prefer to call them, modifying slightly Nathan's nomenclature, chronic arthritis of the chondro-osseous and synovial types respectively. What is the result of *complete* rest in these chronic inflammatory conditions? The synovial membrane and capsule undergo sclerosis, movement is still further obstructed by osteophytes developing at the articular margins, there is secondary shortening of tendons and other periarticular structures, and the joint slowly but surely becomes more and more fixed, often in a position of gross deformity. There exist thousands of men and women who drag their stiff and deformed joints from one spa to another and whose deplorable condition might have been prevented by remembering the dictum that "movement is life." These deformities are nearly all preventable by attention to three main principles, and it is unfortunate that many text-books still speak of the stage of "sequels" as if the latter were inevitable and unpreventable. These principles are as follows:—

1. The joint or joints should be put through the full range of movement daily *although over-exertion is to be avoided*, every effort being made to preserve the nutrition of the joint structures and to maintain muscular tone.

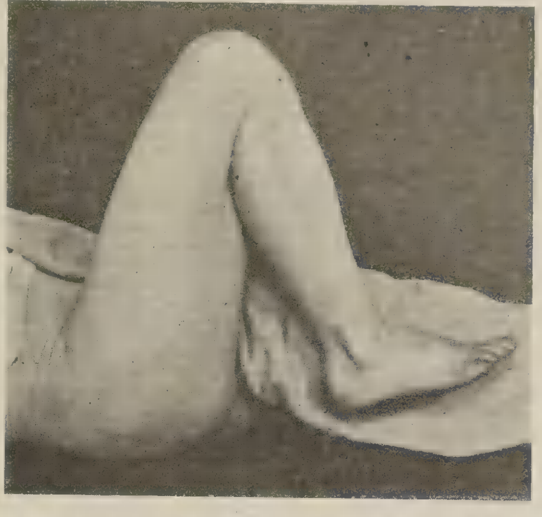
2. In most articular cases, particularly in the lower extremity, the principle of diminution of intra-articular pressure is to be observed.

3. The cause must be simultaneously attacked. There is no greater misapprehension than to imagine that chronic non-tubercular arthritis is of necessity a disease which steadily progresses. I have seen very many cases in which the disease has ceased, and it should be a point of honour with our profession so to act that when this happy result accrues the patient still retains a movable joint. The movements, in addition to preventing scarring of the soft parts, cause the osteophytes to develop in such a way that they do not interfere with movement. In other words, it is possible to train up an osteophyte in the way it should grow. It is not sufficiently realised that in many of the aforementioned sufferers the disease has come to an end and that their symptoms are caused by the deforming stiffness. Medical treatment is of doubtful benefit in this type of patient. The locked joint is crying out for movement. This can be restored by various surgical measures, but particularly by manipulation, a most valuable procedure in suitable cases. The results are sometimes almost dramatic; patients have been restored from lives of painful crippledom to comparatively painless activity. One with very marked changes in the hip-joint is now able to run and even jump (Fig. 7).

Another helpless cripple in whom both hip-joints were affected and who had received every imaginable form of medical treatment and had visited most of the spas in England and Europe is now, after tenotomy of the adductors and manipulation, able to ride a horse and swim.

Manipulation is not advisable in the more acute forms, as it may give rise to a reaction, after which the joint gradually stiffens once more. It is never necessary, and it may be dangerous, to use extreme force. Such a procedure, especially in feeble or debilitated individuals, may be associated with considerable shock, and in these cases it is well to be contented with gradual restoration of full movement by repeated manipulation. Whole-hearted coöperation by the patient in the after-treatment, which may be long, and optimism on the part of the surgeon, are invaluable adjuncts. It is obvious that where movement is obstructed by osteophytes, and in certain other cases, open surgical operation may be indicated. I do not propose, however, to deal with operative treatment now.

FIG. 7.



Showing the degree of active flexion of the right hip after manipulation in a patient with marked osseous changes in the joint. Although previously crippled and subject to severe pain, the patient is now leading an active and comparatively painless existence.

In rheumatoid arthritis, where there is a still greater tendency to limitation of movement, the same lines of treatment are indicated. If anything the indications are even greater, since there is a special tendency in this disease for adhesion between articulating surfaces to occur.

(*c*) *The Rôle of Movement in Chronic Synovitis with Effusion.*—It has long been known that pressure is a valuable factor in bringing about the absorption of "water on the knee" and other joint effusions. The experiments with colloidal silver cited above furnish corroboration from the laboratory of the valuable and important rôle played also by movement in the absorption of an intra-articular effusion. We should bear in mind, however, that the amount of movement should be carefully regulated; for excessive movement will almost certainly cause an inflammatory reaction with the outpouring of an increased amount of fluid.

(*d*) *Early Movement in Injuries or Fractures Involving Articular Surfaces.*—When an injury has caused a loss of substance of the articular cartilage, with exposure of the subjacent cancellous bone, in the absence of movement the irruption of connective tissue from the exposed cancellous spaces is apt to form a bond of union with the opposing articular cartilage. If there is a corresponding loss of articular cartilage on the opposed surface, such adhesion is even more likely to occur. Early movement is imperative in such cases, and there is no evidence that movement, however early, militates against repair of the articular surfaces. I have ascertained experimentally that after excisions of portions of the articular surfaces followed by immediate movement repair proceeds normally. I endeavoured to emphasise in a paper read at the first Congrès International de Médecine et de Pharmacie Militaires, held at Brussels, that the principle of early movement applies with special emphasis to cases of gunshot wounds of joints in which primary union without septic complications has occurred. Such results were not impossible by taking pains and by careful surgery, and it was galling when a stiff joint resulted from improper after-treatment over which the operator had no control. The following case illustrates this point:—

Lieutenant A. was admitted to a C.C.S. August 10th, 1918, with a perforating shell wound of the left knee-joint. The missile entered at the outer side of the ligamentum patellæ, traversed the anterior compartment of the joint in an upwards and inwards direction, and emerged through the quadriceps tendon 1 in. above the patella. In its course the missile caused comminution and loss of substance of the outer fourth of the patella. The edges of the entrance and exit wounds were completely excised, including the affected portions of synovial membrane. Many small loose portions of bone were removed from the joint cavity. Troublesome oozing from the fractured patellar surface was stopped by means of Horsley's wax. Some little trouble was experienced in closing the lower opening in the synovial membrane, but eventually, by undercutting, the external semilunar pad was utilised and a satisfactory closure made.

This officer's subsequent progress is indicated in the following extracts from letters:—

August 26th, 1918 (he writes from a London Hospital): "I left the C.C.S. on the 11th and went down to No.— General Hospital. The doctor there was rather surprised when he saw my knee. He said I was very lucky and marked me for 'Blighty.' I left the next day. Last Tuesday a medical board decided I would be fit for home service in three months and G.S. in six months." Oct. 29th, 1918: "The leg is practically stiff at present. I have had no actual treatment for five or six weeks. Whether they are going to massage or not I don't know. At present they seem to be leaving it alone and allowing the leg to gradually regain strength. There is no pain at all. Do you think it will remain stiff?"

In June, 1921, he writes as follows:—

"You will be disappointed to hear that my knee is still stiff. The range of movement is practically nil, but on the other hand it is never painful or swollen. The wound remained aseptic throughout . . . The leg was left in the splint for three months, and although I asked the doctor what they were going to do as regards massage, nothing was done. Finally I persuaded another doctor to send me to the massage department, where they told me I had come too late. The leg was then quite stiff and immovable. I asked to be invalided out, as I was anxious to get back to work."

Such a story, only too common during the war, was obviously due to lack of even the most elementary knowledge of physiological principles. The principle of early movement in the case of fractures into joints associated with complete solution of continuity of the contiguous shaft is equally important, although to attain it sometimes taxes the mechanical skill and ingenuity of the surgeon to the uttermost. The war gave a great impetus to this problem. Willems, in a paper read at the aforementioned congress, emphasised the rarity of the indications for the classical treatment of such cases by immobilisation in pre-war types of splints and urged the adoption of extension applied directly to the lower fragment of the fracture. This, among other advantages, made possible the mobilisation of the joint from the start. In the non-compound fractures into joints met with in civil life the same early immobilisation may be allowed by operative fixation of the fragments in suitable cases.

(*e*) *Early Movement after Excision with the object of obtaining Movable Joint or Arthroplasty.*—There has been much discussion concerning the nature of the flap to be interposed in the latter procedure. My own clinical and experimental experience causes me to question whether the principle of early movement does not far transcend in importance any considerations concerning the nature of the flap. Are the reasons put forward in favour of arthroplasty based upon really sound scientific foundations?

It is argued that the interposed medium secures easy gliding of the new joint surfaces upon one another, prevents synostosis, and causes the formation of a new synovial cavity. It may be argued, however, that provided early movement is instituted, Nature very rapidly repairs the exposed cancellous spaces—a connective-tissue covering being formed partly by ingrowth from the periosteum at the periphery, and partly by an eruption of connective tissue from the cancellous spaces. I found, moreover, that gradually this connective tissue layer became converted into cartilage, which may eventually mimic somewhat closely normal articular cartilage.

In reply to the second argument we would ask whether early and sustained movement may possibly be more effective in preventing union than interposition of various substances. The argument that the fascial flap is necessary for formation of a new synovial membrane appears somewhat unsatisfactory when we consider that the connective tissues are perfectly capable of constituting quite excellent synovial membranes without any outside assistance as we see in false joints

I wish not to condemn arthroplasty, but merely to point out that we stand in need of further research into this problem.

In conclusion, let me state my conviction that much work remains to be done before the surgery of the articulations rests upon firm foundations.

Some Common Conditions

REQUIRING

ANTE-NATAL CARE.

A Post-Graduate Lecture delivered before the Fellowship of Medicine

By ROBERT A. HENDRY, M.D., B.S.Lond.,

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Ante-natal care is a subject on which so much has been written that there is little ground still unexplored. To-day I propose to consider some of the commoner conditions met with during six years of fairly intensive ante-natal work rather than attempt to deal exhaustively with any one particular section, and to state my personal views for what they are worth, rather than to give a summary of other people's views. Naturally there will be many conditions which I shall not even mention.

The majority of patients attending the clinics were suffering from the minor ailments of pregnancy, gastro-intestinal disturbances being probably the commonest. Of the many remedies for excessive vomiting—not the full-blown hyperemesis gravidarum where the patient is seriously ill and obviously in need of institutional treatment, but for the much commoner variety which merely makes life a burden—I have found the ordinary mist. aperiens alba in about one-quarter to one-eighth of the usual dose, given in several ounces of water, to be so reliable that patients rarely neglected coming back steadily for supplies; and as this meant waiting for sometimes two hours on a draughty landing, my opinion of mist. alba remains high. In other cases, particularly when I thought there was a toxæmic element, Burney Yeo's chlorine mixture has proved of value; the fact that patients continue to take it steadily is sufficient evidence of their opinion.

CONSTIPATION IN PREGNANCY.

Constipation is particularly common in pregnancy. In the poorer classes seen at ante-natal clinics there was little use in giving elaborate directions as to diet, &c.; only too often when a patient attended irregularly the reason was found to be the lack of the few coppers to pay for the medicine, and considerable difficulty was experienced in persuading them to accept anything gratis. Patients' statements of the condition of the bowels require to be received in a critical spirit—the daily evacuation of a few small, hard pellets is, to some, satisfactory evidence that all is well. One lady was not to be shaken from her statement that the bowels acted "regularly"; as her colon was throughout several inches in diameter I was sceptical and inquired—humorously, as I thought—"About once a fortnight?" to which she replied, "Yes, doctor, about that." Sometimes one can only get the reply that the bowel acts "regularly," and further questioning reveals this "regularity" to be in relation to a dose of medicine. Castor oil in particular seems to have some special virtue in the popular regard because one was frequently asked, "When am I to take the oil?" Whether the medicine was taken daily, weekly, or at some irregular interval was usually quite unknown. In such cases, in fact I may say that in the majority of cases, I just took it for granted that the patient was constipated.

A wide choice of drugs is available for the treatment of constipation. As I have indicated, the majority of general and dietetic measures were usually out of the question, and I eventually came to rely chiefly on the mist. alba supplemented by the B.P. pil. aloes et ferri. Aloes is, unfortunately, reputed to have some deleterious effect in pregnancy: after watching the effects of these pills continued over prolonged periods in some thousands of cases my only objection is the inefficiency in a fair number of cases, even when given thrice daily. In such cases pil. colocynth. and hyoscyamus usually proved effective, but even then one had sometimes to give two or even three daily. Where flatulence was distressing a rhubarb and soda mixture was usually substituted for the mist. alb., and I found it acted best when given in hot water after food. Probably about nine-tenths of the cases required, or at any rate received, treatment for constipation, intestinal stasis, and fermentation.

There is great divergence of opinion as to the part played by constipation in the production of disease; personally I am quite satisfied that it is an important factor and that it is responsible for many of the discomforts, and possibly for the origin at least of some of the toxæmias of pregnancy.

ECLAMPSIA, DYSTOCIA, &C.

It is interesting to note that out of about 6000 pregnant women who attended the ante-natal clinics at all regularly not one developed eclampsia. I do not, of course, include patients who attended for the first time with obvious pre-eclamptic symptoms. Such cases were sent at once into hospital or the rest home for adequate treatment. The significance of this is even more striking when I remind you that eclampsia is reputed to occur about once in every 500 pregnancies.

Frequency of micturition is another common complaint, and one for which sometimes no apparent cause can be found. This complaint is often relieved by mist. alba. Why this should be so is not quite clear; it is certainly not due to any resulting looseness of the bowel draining off the fluid, as the small non-purgative doses usually act best. Another unexplained curative effect is that of sodium bicarbonate on the cramps of which complaint is so often made: the cramps that occur in the hip and thigh and are sometimes said to be due to the pressure of the head or the uterus on the lumbo-sacral plexus. I am rather sceptical about this explanation, as the cramps occur chiefly at night, especially when the patient lies on the affected side, which, by the way, remains usually constant. Were they due to pressure, one would expect this to be increased in the day-time and relieved by lying down; when lying on the side the uterus tends to fall away from the pelvis, as is so well seen in the Sims position; and further, one would not expect the bicarbonate to have any effect.

Another direction in which ante-natal supervision is of great value is in the prevention of dystocia. The ease with which the usual external measurements of the pelvis can be made is, I fear, closely paralleled by the rareness of cases in which they are made by the majority of general practitioners. The easily recognised gross pelvic deformity usually carries with it its direct appeal for special treatment in nursing home or hospital. The difficulty—from the point of view of preventive medicine—arises in the less easily recognised minor degrees of contraction and the cases of contracted outlet, and is best met by a full examination in the neighbourhood of the thirty-sixth week of pregnancy. The height of the fundus verifies the period of gestation; previous measurements of the pelvis are confirmed, the position, &c., of the baby determined, the fœtal heart sounds heard, and the head used as a pelvimeter—the best pelvimeter, as Pinard states. My experience is that at the thirty-second week or even earlier the head usually lies in the pelvis—that is, with its greatest diameter below the brim. One can easily demonstrate that with a patient in the recumbent posture the sacral promontory is rarely more than 1 in. below the level of the symphysis pubis, and that in pregnancy the highest point of the head—highest, that is, from the horizontal couch—is rarely 1 in. above the horizontal level of the symphysis.

When the head is not in the pelvis at 36 weeks it may be due to the laxity of abdominal and uterine walls after frequently repeated pregnancies, in which case one can easily press the head into the pelvic cavity, or else to some degree of disproportion which is not necessarily a bar to a spontaneous labour. In this connexion I remember a primigravida with a diagonal conjugate of 3¾ in. and the fœtal head overriding the brim at the thirty-fourth week. She was examined with similar result several times during the next month and was admitted in labour the day before the date arranged for admission for Cæsarean section. The head was then in the pelvic cavity, and she expelled spontaneously a fine 8¼ lb. baby.

PELVIC CONTRACTION.

Having arrived at a diagnosis of pelvic contraction, the best means of delivering a living baby is to be sought. In the grosser degrees where the head cannot reasonably be expected to pass the only safe course is to arrange for Cæsarean section; in the lesser degrees the problem is more difficult. On the one hand all cases can be allowed to go into labour—under supervision—and when the head does not come down satisfactorily can be assisted either with forceps or by version, or Cæsarean section can be performed. On the other hand, the patients may be watched and labour induced prematurely in suitable cases; in those not suitable for induction Cæsarean section may be arranged.

If the first course be followed, there will be many emergency Cæsarean sections with the increased maternal risk attached thereto; forceps or version in emergency will be applied oftener and increase considerably the risk of stillbirth. Further, there being little need to keep the patients under close observation, they do not attend regularly, do not realise their danger and the need to report at hospital as soon as labour begins. Very naturally they desire to have the labour at home where they engage a midwife. A doctor is called in, and, sometimes after vainly trying to deliver, sends the woman into hospital, too late for anything but a craniotomy. If the other course is followed the Cæsarean sections will be less numerous, as they will be usually at a pre-arranged convenient time, and there will be few emergencies. The maternal risk from induction, properly carried out, is infinitesimal, and very much less than that in the forceps cases, &c., in the other series.

To obtain good results in induction cases requires prolonged and accurate observation, combined with the utmost delicacy of judgment as to the time chosen. The baby must be sufficiently well developed for its prematurity not to be a danger; that is, it should be within four, or in a few cases five, weeks of term. It must not be so large that natural expulsion is unlikely; the premature head is usually insufficiently ossified to withstand the forceps, and any obstetric interference considerably increases the intra-natal death-rate. Weekly observation of the relative size of the head and pelvis will indicate the best time for the induction: that is when, during the last month of gestation, the head is just rising out of or can no longer be pressed into the pelvis. The moulding which occurs during labour will permit of the engagement and transit of the head, now grown too large, in its natural shape, to remain in or to enter the pelvis.

The pelvis with contracted outlet has caused me the greatest difficulties and anxieties. I have never been satisfied with the accuracy of my measurements between the ischial tuberosities. The thick pad of tough fat which prevents discomfort when sitting on a hard surface equally prevents the definite marking of points from which to measure. At one time I believed that I had found a means, apart from vaginal examination, of recognising this type by an unusually large difference between the interspinous and intercristal diameters—say 2 to 2½ in., coupled with an external conjugate of 8 in. or more. While I am satisfied that this type of measurement signifies contracted outlet, I am equally satisfied that a pelvis with a contracted outlet may have the above measurements normal, and that vaginal examination is the only means of recognition. Radiography offers a promising field for investigation and confirmation. Further, I have an impression that this type of contracted pelvis is on the increase; at one time it was rarely noted, but now it is constantly being found. I do not think that the difference is due purely to fuller investigation.

Accurate measurement of the degree of contraction of the outlet being, so far as I am concerned, impossible, it may be difficult to decide sometimes whether natural delivery is probable or not. As a general rule a good idea may be formed after careful palpation of the pubic arch, ischial tuberosities and spines, and, as Whitridge Williams has shown, the amount of room between the tuberosities and the sacrum; the further back the sacrum the better chance of successful delivery. In a doubtful case one has to balance the risks of a stiff forceps delivery with unavoidable damage to the head, of a severe perineal tear—possibly through the sphincter requiring secondary repair at some future date—against those of a straightforward Cæsarean section, and I think there can be little doubt that the latter are the less.

Some patients come with a history of abnormality in earlier pregnancies or labours, and for some, of course, nothing can be done. I remember one patient who was sent because her first baby was an anencephalic. Malformations, of course, tend to recur in succeeding pregnancies, and are probably due to some inherent defect in the sex cells. This patient's gastro-intestinal disturbance was kept under control, and when she was examined late in pregnancy hydramnios and a baby with a very small head were recognised. I informed the midwife that I feared another anencephalic monster was present; however, she brought forth twins, of which one was anencephalic and the other normal. I think she never quite decided whether to be grateful for the one normal baby or to reproach me for not having given sufficient medicine to make both babies normal!

Difficult Labour.

Another group of cases report difficult labours, usually forceps, and sometimes craniotomies. Careful examination of the pelvis shows it to be of normal size, and no history of oversized babies is forthcoming. An isolated forceps delivery is frequently only evidence of a time-saving device on the part of the doctor, but repetition, especially when required in midwives' cases, necessitates closer investigation. The patient is frequently over 30 or even 40 years of age, and her tissues are flabby, anæmic, and fat. She is constipated and flatulent, and her abdomen is inclined to be pendulous; the uterine wall is lax, and, masked to a certain extent by the fat abdominal wall, allows easy palpation of the baby. The head can easily be pushed low in the pelvis. Prolonged manipulation of the uterine wall rarely stimulates contraction. The condition of inertia affects all her muscular system, voluntary and involuntary, and is confirmed by the low blood pressure, which may be below 100 instead of about 120 m.m. of mercury. The diagnosis points out the obvious treatment. Calcium, best given as the freshly prepared lactate, and pituitary extract, say, 0·5 c.cm., given intramuscularly night and morning, by raising the muscle tone and increasing the excitability of the uterus, have proved successful in a number of cases.

Similar treatment has proved of value in cases with repeated post-partum hæmorrhage in past labours when the circumstances have indicated inertia as the cause. When the hæmorrhage has been due to an adherent placenta the outlook is less promising; one can only be prepared to interfere during the third stage before the blood loss is serious. I have found neither medical treatment during pregnancy nor curetting, in the few cases where I have known it tried, to be of any value. Moreover, there is no reason to expect a more healthy endometrium to be regenerated from the fragments remaining after a curetting than from the decidual remains after labour. Further, I know of no evidence that the lesion is in the endometrium—the fault may quite possibly be in the chorion.

Syphilis in Pregnancy.

The incidence and diagnosis of latent syphilis is an interesting problem in pregnancy. Active syphilis is a reasonably straightforward affair as regards diagnosis, at all events, but one has so little to work on in latent syphilis. There is pretty general agreement that reliable evidence of syphilis can only be demonstrated in about 16 per cent. of stillbirths—the figure certainly is under 20 per cent. Obviously four out of five stillbirths are not syphilitic, and there is no justification for considering previous stillbirths to be evidence of syphilis. Abortions are even more confusing owing to the great difficulty, or even impossibility, of finding the spirochæte in known syphilitic cases. It has been suggested that this is due to the action of placental ferments on the spirochætes causing these to break up into biologically inactive granules which, on the removal of the influence of the ferments, develop into spirochætes again. The two objections I have to this view are: (1) That as this would imply the triumph of the resisting forces over the invader, what kills the ovum? (2) The ovum having been killed, and the placental ferments being at least a steadily diminishing quantity, why do the granules never blossom forth into spirochætes? A pathological report on a previous stillbirth, if positive, of course settles the question; a negative report is not quite so certain. One of my cases illustrates a difficult point. A patient came under treatment after an abortion and a still-birth. The Wassermann reaction (W.R.) was negative; she was treated by an iron tonic and had a healthy baby. The treatment was resumed in her next pregnancy, and she had, about term, a macerated stillbirth in which were found spirochætes. The most careful investigation revealed no support for recent infection, and I am still in doubt as to the sequence of events in this case.

The classical history of repeated abortions, premature and then full-term stillbirths, nonmacerated stillbirths, and neo-natal deaths is, in my experience, very rare. In a series of about 100 cases of latent syphilis which I investigated closely, I found the greatest variations in the history. Comparing syphiitic and non-syphilitic cases, the most suspicious eature—when it was present and nephritis could be excluded—was the repetition of premature stillbirths. This is not very satisfactory, and after all which of us is satisfied to await this or the classical sequence ?

As a further guide we have the W.R. I believe it to be, generally speaking, reasonably reliable (rather heavily qualified, I am afraid). One has had the W.R. reported negative during a pregnancy which terminated in a syphilitic stillbirth, and—even more unpleasant from my point of view—two cases where the blood was reported positive were sent to a venereal clinic for treatment; the blood was again examined, and this time reported negative and the patients told there was nothing abnormal to be ound. The remainder of the tale can be left to the magination.

Having arrived at a diagnosis of syphilis in any given case, the questions of treatment and prognosis arise. In women who are first seen during pregnancy, think the prognosis depends chiefly on the degree of infection and damage already present in the ovum. One can scarcely hope, even approximately, to estore to normal a syphilitic liver or placenta. In women who became pregnant during antisyphilitic reatment I found the prognosis uniformly good. One had to deal with these women before the V.D. linics were started; treatment by salvarsan and its mprovements and substitutes was out of the question xcept in isolated cases, and mercury was the standby. Hydrarg. cum creta tablets, 1 gr. t.d.s., with the necessary attention to oral hygiene, proved uniformly uccessful, and eventually I discarded the grey oil, which was resented by many patients.

NON-SYPHILITIC ABORTIONS AND STILLBIRTHS.

The patients with repeated abortions and stillirths without any evidence of syphilis present a ery difficult problem. Probably about one-fifth or ne-quarter are due to chronic nephritis, which may self be anomalous, as the following case shows. A oman, aged something over 30, was a second wife; er husband had had a healthy family by his first ife. The patient aborted regularly in the sixth month, the abortion being preceded by the appearnce of large quantities of albumin in the urine which, generally speaking, contained only a faint race or none, particularly when I came across her rst. In the later intervals the albumin did not isappear to the same extent and one came to the onclusion that she was a chronic nephritic; unforunately, she became pregnant again and developed fatal cerebral hæmorrhage. I was surprised at he extent to which the kidneys were affected. The est thing such patients can do is not to become regnant.

After eliminating the syphilitic and nephritic atients with repeated abortions, &c., we are still aced with about three-fifths of these cases where o obvious lesion can be found. One of the drugs ecommended is potassium chlorate, but I have not ad much experience of it. I have generally precribed iron in some form, the tinct. ferri perchlor. hen gastric conditions permitted, or some of the ilder preparations in other patients. When iron as failed I have usually found pot. chlorate also nsuccessful, and have sometimes found good results llow the administration of mercury, even where I as entirely satisfied that syphilis could be excluded. atterly I have usually given iron and mercury in hese cases. Naturally these patients tend to drift way after unsuccessful treatment; not many of hem can be followed through three or more pregnancies, and one cannot always find out what treatent has been adopted by one's predecessors in the tient's life-cycle.

HYSTERICAL FITS,

WITH SOME REFERENCE TO THEIR TREATMENT.*

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FROM a psychological aspect it may be argued that the genesis of the neuroses, in whatever manner their manifestations may be expressed, is identical, and that therefore the separation of one particular group of symptoms from another, and the direction of attention to their treatment, is erroneous. This argument is logical enough, but in practice the suggestive factor is primarily associated with most, if not all forms of treatment, whether the suggestion is directed to a supposed cause of the disorder or, as in the method about to be described, to the removal of symptoms. Attention is here centred on that group of symptoms of the neuroses which is characterised by paroxysms or seizures and commonly termed the fits of hysteria.

The modern conception of the genesis of the neuroses, unlike the ancient supposition that hysteria was the outcome of wandering of the womb, cannot be repudiated in the light of anatomical facts. An example of this is to be found in that method of psychotherapeutic treatment of which the theory is, in brief, to ascertain the genesis of the neurotic symptoms, supposedly to be found in repressed desires too painful to be remembered—to release the repressed desire, then to allow it to become attached to the idea of the physician, and finally to release the energy expressed in the repressed desire and transfer it to a socially useful aim. It is claimed for this method, however, that proper technique does not admit of any suggestive factor. If this is true, the high degree of technical skill essential to carry out the treatment must confine the performance of such a process to those only who possess unusual advantages. Again, disastrous results, which are not uncommon, are attributed to defective technique; practical training is therefore rendered too dangerous to be undertaken. Moreover, the process of treatment occupies a long time and much patience is requisite in seeing the same individual day after day for years. Further, the penalty, expressed in distasteful memories, of symbolic interpretation involved in the reading of Freudian literature will tend to inhibit some from a further study of a subject which so closely simulates a pathological sexual curiosity. Finally, ignorance of the subject may persist and be the outcome of domestic cowardice revealed in a substitution of the flames for the bookshelf.

It may be safely stated that at present most patients suffering from paroxysms of the neuroses are treated during the paroxysm by the infliction of pain—supra-orbital pressure, strong faradism, &c.—but methods employed in treatment of seizures are of little value in prevention of a recurrence. The benefits of physic dispensed to combat the recurrence of hysterical fits lie, in all probability, in the suggestive factor arising from the administration of drugs. It would be difficult to discover a less burdensome aid to suggestion. The results of such treatment are in the possession of the experience of most physicians and need not be further discussed.

Clinical Observations.

The method that I have adopted to prevent recurrences of the fits of hysteria is based on the following clinical observations: (*a*) During a paroxysm the patient reacts to external stimuli. (*b*) A patient suffering from the disorder can be made to reproduce a seizure to order by a simple method. (*c*) The seizure thus produced corresponds in every apparent detail to the patient's previous attacks. (*d*) One type of seizure is constant in the individual and there is no change from one type into another. (*e*) During the paroxysm reproduced to order the patient can be made to realise that consciousness is retained from the beginning to the end of the seizure. (*f*) The patient, after realising that there is no loss of consciousness in the seizure, often becomes a good subject in whom the power of restraint or inhibition can be re-educated. (*g*) After a short course of re-education frequently no further attacks occur. (*h*) There are definite types of seizures which render classification possible.

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During a hysterical attack a patient reacts to external stimuli—for example, the convulsion will subside on the infliction of pain if the latter is severe enough. Again, the attack becomes aggravated on the application of passive restraint, indeed, it would appear that the severity of an attack varies conversely with the degree of force exerted in attempting to hold the patient down. Such reaction to external stimuli would suggest that the degree of loss of sensibility is not deep during a seizure. The depth of insensibility would appear, from observation, to vary with the type of seizure rather than with the severity of the attack; the strongest stimuli being needed to rouse patients in whom tonic-like fits occur. Increase in the violence of the seizure on restraint would indicate that a seizure can be demonstrated to order, and this indication is strengthened by the occurrence of an attack when the patient is sufficiently urged to demonstrate a seizure.

In order to bring on a paroxysm in a patient subject to hysterical fits, considerable persuasion is sometimes needed and patients vary markedly in their willingness to produce an attack to order. Usually, at first, the patients will assert that it is impossible for them to demonstrate an attack in view of a lack of knowledge of its nature; however, persistence in urging the patient will result in feeble attempts being made by him to describe in words the nature of the attack. In cases where much difficulty is experienced in persuading the patient, methods may be employed to assist him to demonstrate the attack. For example, while standing he is commanded to close his eyes tightly and to make his body tense; while he lies on his back on a couch, he is ordered to raise his legs against the demonstrator's hands, which are placed on the patient's ankles. In the majority of cases an attack is readily reproduced by the latter method, but in some cases constant persuasion accompanied by determination is needed. It is, of course, essential to secure the patient's confidence, otherwise he may think he is being ridiculed.

Attacks thus produced resemble in every apparent detail the patient's previous attacks. This conclusion is arrived at by observing the seizure while the patient is waiting his turn for attention in the out-patient department of the hospital where seizures are not uncommon, particularly on the first visit, and afterwards persuading the patient to demonstrate a seizure to order. Again, friends of the patient who have observed previous seizures in the individual render further confirmatory evidence. Moreover, the patient will admit the similarity of the seizures after he has demonstrated an attack to order.

Although seizures vary in their character in different individuals, they always assume the same type in the particular individual, and there is no change from one type of seizure to another type. However, the severity of an attack in a given subject is rarely constant, and often mild attacks alternate with strong ones.

During a paroxysm produced to order the patient is constantly spoken to, and instructed to direct his attention to the general nature of the attack until it has subsided, after which he is asked to describe in words the various movements that were performed in the seizure. If his description appears to be hazy, the patient is again urged to reproduce an attack, which must be repeated until he has in general an intelligent conception of the nature of the movements. The patient is next asked to describe in detail by words the exact nature of the initial movements; if he cannot, an attack is repeatedly produced until he is able to do this. Finally his attention is directed to, and he is asked to describe the symptoms that preceded the initial movements. Some, on realising that they are conscious during a seizure, and that they have formed a clear idea of the nature of the attack from beginning to end, have no further seizures. But the majority of patients require a period of time during which re-education in their powers of inhibition must be undertaken. In order to accomplish this, my method is first of all to instruct the patient to lie on a couch and urge him to have an attack, during which time he is instructed to raise the lower limbs against the resistance of my hands placed on his ankles. After the attack has subsided he is ordered again to go through the same movements, but this time he is urged to relax the body during his attempts to raise the limbs and to inhibit the tendency to make the body rigid. It will be observed that although the patient is attempting to carry out the movement, the limbs are rigid and raised only a few inches from the couch in spite of the fact that pressure exerted on the ankles is so slight that the performance of the movement could not possibly be interfered with passively. It is advisable to persist with the patient until he is able to raise the legs at right angles to the trunk. When this is accomplished the muscles of the limbs are no longer rigid, and the patient becomes normally relaxed; the face no longer bears the expression of great strain, and there is reasonable ground to anticipate that the patient will successfully inhibit subsequent tendencies to seizures. The result is not always satisfactory, and if the previous methods have failed it is necessary to attempt to break down the resistance of the patient by inducing attacks frequently. For example, if he is subject to three or four attacks a day, attacks to order must be brought on in excess of that number and diminished from day to day and, if necessary, from week to week, depending upon whether or not there is a return of the paroxysm in the interval. It will be found that the patient will soon resent this treatment in view of its exhausting nature, and this indicates still more strenuous efforts to conquer the patient by producing even a greater number of attacks and so create in him an atmosphere of aversion to the attacks. The process, if successful, is usually not a long one, and the resistance of the patient breaks down after the second or third time. This method of treatment should not be undertaken in types 3, 6, and 7.

Types of Seizures.

Seizures which are the outcome of the neuroses present many types, and I have observed the following principal types: (1) An apparent momentary loss of consciousness, a faint; (2) a state of apparent coma lasting for hours, in which the pulse and respiration rates are normal; (3) a pseudo-tonic convulsion; (4) a pseudo-clonic convulsion; (5) a convulsion beginning in a pseudo-tonic contraction, followed by a pseudo-clonic contraction; (6) hystero-epilepsy; (7) attacks of uncontrollable laughing or crying in which the patient passes large quantities of urine; (8) other violent movements expressed in attempts to injure himself or those who attempt to restrain the patient by holding him down; (9) attacks of staggering. Paroxysms of the neuroses are not uncommon in epileptics.

Illustrative Cases.

Type 1.—An apparent momentary loss of consciousness is not uncommon in neurasthenic women whose symptoms are in the most part subjective. These patients complain of vertigo or fainting, in which they recognise their surroundings, but are unable to speak during the attack. Other conditions which cause vertigo and fainting must, of course, be eliminated before a diagnosis of hysteria is made. From the history of some of these patients petit mal may be suspected, and in the absence of witnessing an attack such a diagnosis is not infrequently made. The demonstration of the attack to order always confirms the diagnosis.

A woman of 45 years, the wife of a hairdresser, who resented he imputation that her husband was a barber, complained f "neurasthenia." She did not volunteer information egarding the occurrence of attacks, and when asked directly f she ever fainted at first affirmed that she did not have ysteria and was annoyed. Soon, however, she admitted aving attacks in which she "lost" herself for a moment, lways in the presence of her husband. After the threat hat she would leave the hospital and return to her home ather than submit to the indignity of demonstrating a eizure her confidence was ultimately gained and she was at ength persuaded to demonstrate the attack, in which she ecame rigid, clutched her right forearm with her left hand nd threw her head over the back of the chair on which she as sitting and began to respire noisily. The face became ightly cyanosed and her eyes were closed. The attack sted about 15 seconds. Through failure on the part of an experienced nurse to inhibit a laugh, the patient rose uickly to her feet, left the room indignantly, and has not nce returned to the hospital.

This illustrates that care must be taken to gain nd remain in the confidence of the patient, and the nfortunate results that ensue if hysterical manifesations are not treated with respect.

Type 2.—The simulation of coma as the outcome f the neuroses is, in my experience, not common in ospital practice. It may be argued that when atients assume a state of coma they should not be onsidered as hysterical, but it must be admitted that e patient at such a time is not normal mentally. he condition often occurs in young women who are naccustomed to the ordinary knocks of life. They e usually irritable.

A young woman of 22 years was to be married in a week's me. One night, just after dinner, her mother effected an trance into the consciousness of the patient's fiancé; in onsequence of which the mind of the latter was impervious r a moment to a question asked by the patient, who, eling slighted, retired from the room, to be further subitted to the indignity of a lack of recognition of her absence r nearly an hour. She was found on her bed fully dressed d could not be roused. It was reported that she was lseless but breathed slightly, and the diagnosis transitted over the telephone was cerebral hæmorrhage. On amining the patient in the presence of relatives she would t reply to any questions asked her, and no effort was made rouse her by force. After the relatives had left the room e suddenly asked angrily, "Who asked you to come re?" The patient's confidence was soon obtained, and e related the above-mentioned incident with much emotion. e patient has since become the mother of a healthy child d there has been no repetition of the attacks.

In such cases it is advisable not to acquaint the latives with the nature of the disturbance.

Type 3.—A tonic-like contraction of the whole body, e history of which simulates the tonic stage of an ileptic seizure, resembles clinically the first part of a stero-epileptic seizure, but does not progress further an a slight tilting forwards of the pelvis. The els and occiput are pressed firmly against the couch, e body is rigid, and the pelvis is raised from the rface of the couch. The face is flushed, the eyes sed tightly, and there is an expression of severe tress. During this pseudo-tonic state the breath is d. After half a minute to a minute the head turns her to the right or to the left and the muscles of the dy suddenly relax. The respirations then become y rapid and the patient either cries or laughs.

chorus girl, aged 21, fell from some badly constructed ps on the stage at a rehearsal and injured the back of her d and had a seizure. There was no scar or other evidence njury. She was unable the next day to take her part in performance in view of another attack which, when nonstrated to order, proved to be of the type described e. For two months the attacks occurred on an average twice a week, and for a week previous to my seeing her attack occurred every day. Considerable persuasion needed in this case to produce an attack to order. entually an attack was induced, after the patient was tructed to raise the limbs against passive resistance lied to the ankles. The patient's sister witnessed this ack as she had other previous seizures and confirmed that as similar in every detail to the other attacks. During seizure the patient was spoken to and replied to questions ed her with considerable effort. When the attack had sided she was questioned as to whether she was of the opinion that further attacks could be prevented with her own effort, and she replied in the affirmative, affirming that she did not recognise before that she was conscious during the attacks. She returned to her work in the chorus in a week's time, and did not fail to attend either rehearsals or performances. A month later on seeing the patient she said that there had been no return of the attacks. Two months later a seizure occurred in bed, and she volunteered the information that it was difficult for her to restrain the seizure during the menstrual periods; she deliberately had an attack, which she said she could have inhibited, but chose a time when it did not interfere with her work. She further stated that she was of the opinion that if she married it would not be necessary for her to have an attack, and asked advice regarding that matter. The patient has been married for nearly two years and there has been no recurrence of the seizures.

This particular case is chosen for illustration here because it can be regarded as favourable to psychoanalytical speculation; it may be asked what treatment is to be employed in cases where lack of opportunity renders marriage impossible? When the patient realises that the condition resolves itself into one of conscious choice, it would appear that there is no treatment except that which pertains to the practice of restraint on the part of the patient. These patients return to their duties, and although attacks sometimes occur in secret, their productive capacity is not interfered with and they become useful citizens.

Type 4.—Clonic-like fits are more common in men, and were in my experience the only type of hysterical seizure that occurred in soldiers in the recent war. A localised tremor is usually present, either in the fingers or the tongue, or there may be a blepharospasm. The attack, as a rule, comes on with some excitement or sudden shock, and often the banging of a door is sufficient to bring on a seizure. The tremor, which at first may be fine, becomes coarse, soon spreading all over the body; the patient falls down in a coarse generalised tremor and appears to be unconscious. As a rule he does not become violent unless he is passively restrained, when the convulsions become greatly aggravated.

A sawyer, aged 24, was unable to work for five years on account of seizures which began during an air raid in 1916, and one or more attacks occurred almost every day. There was a history in this case of mutism, which persisted for six months after the first seizure, to be followed by stammering. A partial right hemianæsthesia was made out. The patient responded to the suggestion to demonstrate an attack without much persuasion. This attack when fully matured consisted of violent clonic-like movements of voluntary muscles including the face, neck, trunk, and limbs. During the first attack demonstrated to order the patient did not respond to questions asked him, and after it had subsided he was unable to describe its nature. During the second attack produced to order the patient replied to questions during the first part of the attack, but when the movements became violent he did not answer questions put to him. When he was seen a week later he had had no attacks in the interval but complained of severe fatigue, the outcome of attacks produced during his former visit. He protested against further attacks being produced, but eventually submitted; in the next attack to order he was able to respond to questions asked him throughout, and was afterwards able to describe in detail the nature of the attacks. The following week, during an attack produced to order, he was instructed to relax himself as soon as the tremor became generalised by allowing his arms to fall loosely at his sides. A year after this treatment the patient had had no recurrence of the seizures, and he had been employed for nearly that length of time in a remunerative position. Sometimes, he said, he had a feeling of an attack impending, but by relaxing himself he was always able to prevent it.

It should be stated that this patient was of fairly average intelligence, in which case a good result is to be expected.

Type 5.—Seizures beginning in tonic-like contractions and followed by clonic-like contractions are not uncommon in men, and this type is most frequently mistaken for epilepsy. The patient suddenly becomes rigid when standing, his trunk is erect, and his head thrown back; he staggers backwards or sideways and finally falls, shaking all over. He may or may not injure himself when he falls. This type resembles in many details the one just described, but differs from it in an absence of the initial tremor and in the presence of a definite initial rigid state.

A grocer's assistant, aged 55, lost his wife, who died suddenly from heart failure. On hearing the news he collapsed and was thereafter subject to seizures, which, according to his local doctor's description, appeared to be correctly diagnosed as epilepsy. The attacks occurred on an average of once a day. When the patient was asked to describe in words the nature of the attack his eyeballs suddenly rolled upwards, his head was thrown back, and he remained rigid for about ten seconds. Then he began to stagger backwards and to shake all over and fell, bruising his right forearm. A nurse in attendance tried to prevent him from falling and on my instructions attempted to hold him down after he had fallen. With this restraint the violence of the shaking became aggravated. The attack began to subside with the removal of the restraint. With renewed passive restraint the movements again became violent, so that with repeated application of restraint the condition simulated status epilepticus, but it differed from the latter in the absence of a repetition of the rigid stage. When the restraint was removed altogether and the patient left to himself the paroxysm ceased and when he was instructed to rise to his feet he did so with difficulty and staggered. When seen next time the patient was urged to produce another seizure and with some persuasion he succeeded in demonstrating an attack which was in all respects similar to the preceding one. Again he fell and injured his right forearm. After the attack had subsided he was urged to demonstrate another seizure and resented the suggestion because of the pain in his right forearm; he submitted, however, but this time, when he fell he did not injure himself. On this occasion four attacks were induced and afterwards he was instructed to return in a week's time and informed that more attacks would be brought on if in the interval there was a recurrence. When he returned a week later, in spite of the fact of no attacks in the interval, two attacks were induced much to the patient's distress. The following week one attack was brought on, although there had not been a repetition of the seizures. The result was completely satisfactory. He was treated over a period of six weeks and there has been no recurrence of attacks.

Type 6.—Hystero-epilepsy or grande hysterie, as described in detail by Charcot and Richer, is not common in this country, and my experience of this type of hysteria is confined to four cases, only one of which was treated by the methods described here. The patients were all women. In view of the spectacular nature of the attack and the common idea that the state is partly epileptic, a record of observations made in one of the cases will be given. The attack was induced in the patient and witnessed by three colleagues.

An unmarried woman, aged 26, first associated herself with these attacks at the age of 18. The attacks occurred twice a week on an average. Of their nature, the patient claimed to be entirely ignorant, and she was therefore unable to give a description of them. She was on one occasion incontinent during an attack when it occurred in bed, and her tongue was sore after the attack. The patient was sent into a dressing room with the order to place herself on a couch there and to demonstrate the attack. The order was at first resented, but she was eventually persuaded, after a complaint that the couch was too narrow for the performance! The attack began by the patient throwing herself into a marked degree of generalised tension as if she were attempting to increase her stature by an apparent stretching of her neck and forcible plantar flexion of the feet, so that their plantar surfaces almost, but not quite, approximated to the surface of the couch, the legs being drawn tightly together. The arms were drawn close to the sides of the body, and they also appeared to be lengthened by over-extension of the wrists and fingers, the forearms being at the same time markedly pronated, so that the dorsal surfaces of the thumbs approximated to the surface of the couch. The eyes turned upward, the scleræ only being exposed; the face, almost from the beginning, became distorted in grimaces, and the cheeks and lips were firmly pressed against the gums and teeth. The patient's explanation of the movements of the face, at this stage, was to the effect that such contortions assisted in the production of saliva. Slowly the pelvis was raised from the surface of the couch with the assistance of her thumbs, and at the same time the head was gradually thrown backward. The soles of the feet now became approximated to the surface of the couch and were firmly pressed against it. The arms began to draw away from the sides of the body. Slowly the head retracted until the forehead rested on the surface of the couch. This was accomplished by the patient tilting the pelvis more and more ventral by drawing the feet under the trunk towards the head until finally the forehead and the heels became about approximated. The face was by this time intensely cyanosed, and the front of the neck appeared markedly swollen, the cyanosis being due to partial suffocation in view of the position of the head. Respirations became quickened and the patient could be seen to protrude blood-stained foam between her teeth by forcibly pressing the tongue against them. The arms assumed a position at right angles with the trunk and athetoid-like movements appeared in the fingers. The explanation given by the patient of the position of the arms was to the effect that it helped her to balance. When the arms were forcibly moved in all directions they appeared to be wax-like, and the patient's equilibrium was not upset in these movements. The arched body was extremely tense and supported without difficulty strong pressure on the abdomen. In this state of arc de cercle the patient answered questions asked her by others in the room, but to the question, "You do not know what I am saying?" asked by a colleague, who at this stage came in, she did not reply. The patient remained in this position for ten minutes, and clonic-like movements occurred for a few seconds as the body tilted over to the right side; gradual relaxation from superextension slowly took place, until the patient once more assumed a relaxed dorsal position. The plantar surfaces of the feet on the couch together with the forehead, during the severe state of opisthotonus, formed a tripod, and seemed to be sufficient to support the body in that position. With complete relaxation there was extreme fatigue. In the course of this attack there was no appearance of the third and fourth stages as described by Charcot, in which dramas are enacted and a period of delirium occurs. The treatment of the seizure consisted in demonstrating to the patient that she was not, as she supposed, unconscious during the attack, but rather, fully alive to every detail. When the patient returned in a fortnight she reported the occurrence of one paroxysm when she was in bed. On being told that the attack could be controlled the same as walking could be controlled, she admitted that the attack had been deliberately induced by her because it produced a "pleasant sensation." By degrees she chose to inhibit the impulse to produce the sensation, but not altogether.

The attacks have been reduced in the last two years from several a week to about the same number a year, and the paroxysms occur now when she is alone and they do not interfere with her duties.

Type 7.—Paroxysms of uncontrollable laughing or crying in which large quantities of urine are passed in my experience only occur in women who practise uncleanliness with themselves. Attempts to induce an attack in these cases are, of course, to be avoided. Such patients are benefited by hard manual labour on farms.

Type 8.—Seizures which may be described as violent movements in which the patients tear at their clothing, attempt to injure those who make an effort to restrain them, and in the event of nobody attempting to do so, will pull at their own hair and injure themselves by scratching or biting their arms, are not uncommon in both sexes, but are much more frequent in females. The movements are very grotesque, and the patients in their agitation will expose themselves, shout, and call out for a friend. The condition is sometimes difficult to diagnose from manic depressive insanity at first sight. The seizure in no way resembles epilepsy.

A woman, 30 years of age, suffered from this type of attack for a year, and seizures occurred on an average of three times a week. The first paroxysm began after she was told that she had contracted syphilis from her husband and while waiting for an intravenous injection of novarsenobillon. The attack was very violent, and she was held down by fellow patients in the out-patient waiting-room. A week later, when she was urged to demonstrate an attack, she began it by turning her trunk and head violently from left to right. She threw out her arms and called for her mother, and knocked her head against the floor. The hair soon became dishevelled, and she began to tear at her clothing, shouting louder and louder. She was firmly ordered to rise to her feet, which she did, and complained that her arm was numbed. She made a promise to control these attacks, and there has been no recurrence for six months.

Type 9.—Attacks of staggering, which, according to the subjective evidence gained from the patient would suggest petit mal, are often preceded by globus, palpitations, or disagreeable sensations in the abdomen. The attack may occur in the absence of these symptoms or one or all of them may be present.

A joiner, aged 48 years, came over giddy when working on a building in a safe part and lost his "senses" but did not fall. There were no signs of organic disease, and other causes of vertigo were eliminated before arriving at a diagnosis. When he was asked to demonstrate an attack he said he became giddy and lost himself completely, but could not demonstrate the nature of the attack. After much persuasion and after he had paced up and down the room in his attempt to produce an attack for several minutes, he suddenly began to stagger sideways and to the right, reaching out his right hand for the purpose of supporting himself at a table. The patient said he was giddy, and that the attack which had just occurred was not the outcome of efforts to demonstrate the attack. He was at once ordered to produce another seizure, a suggestion to which he almost immediately responded. The attacks were repeated several times, and he was finally convinced that he was completely conscious during the attacks, and that it was in his power to bring on an attack at any time as it was under the control of his will. This resulted in a subsidence of the attacks for eight months; since that time there is no note made of his case.

Epileptics may be subjects of paroxysms of the neuroses. A hysterical attack may immediately follow an epileptic seizure, or the former may bear no relation to the latter as far as its occurrence in time is concerned. Again, the occurrence of petit mal, grand mal, and paroxysms of the neuroses are not uncommon in the same individual. The conditions must be treated separately. These patients should be given luminal, one and a half grains, three times a day in addition to the treatment for the hysterical condition.

Conclusion.

A diagnosis between hysterical fits and epilepsy is rendered difficult and sometimes impossible if no seizure is witnessed. Babinski and Froment were able to reproduce a hysterical fit in a subject by suggestion aided by electricity. Electricity is certainly not needed to reproduce a hysterical fit, and it is doubtful if extraneous suggestion is needed. I have frequently seen hysterical fits reproduced while the patient has attempted to raise the lower limbs against passive resistance, no order being given and no comment made other than "raise the lower limbs." I have the permission of an officer who was on duty at the recent Trooping of the Colours to state that 5 per cent. of the rank and file, after standing in a rigid state of attention, fell out in a fit in the course of the first ten minutes of the performance. An attack seems always to follow a certain state of tone of the muscles, which is created by simultaneous contraction of agonists and antagonists. Clonic-like movements occur in many neurasthenic individuals subjected to the same test, and in them there is the same distressed facial expression. No wholesome effort is made to overcome the passive resistance as in the healthy individual, who usually either succeeds or in his attempt to do so sits upright. This test is, I believe, of considerable diagnostic value, and may be as easy or as difficult to elicit as a plantar reflex.

The treatment which has been considered in these cases resolves itself into the removal of symptoms, and in the selection of 100 cases for the purpose of determining results, an equal number of each type of paroxysm has been chosen as far as that has been possible. The record has been brought up to a recent date, and the period of freedom from the attacks varied from five years to six months. The percentage of recoveries from attacks is about 60. Types 3, 6, and 7 materially diminished the number of apparent "cures," but in them improvement was observed in the marked reduction in the number of seizures and in the fact that the attacks occurred when the patients were alone.

Two of the reported cases were patients at Queen-square, and I have to thank Dr. Gordon Holmes and Dr. Hinds Howell for permission to publish them.

THE ANTICOAGULATING ACTION OF THE ARSENOBENZOLS ON BLOOD.

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Flandin and Tzanck have described in THE LANCET [1] the anticoagulating action of the arsenobenzols on blood. They state that (1) the coagulation time of blood from an individual who has received an intravenous injection of arsenobenzol may extend from 30 minutes to 24 hours or longer, and (2) the state of incoagulability, as shown by repeated samples of blood, may continue for a period varying from several hours to several days. The authors deduce from their observations the necessity for considering whether a patient is under treatment with arsenobenzol before submitting to surgical procedures. They also suggest that arsenobenzol is superior to citrate as an anticoagulant for blood, since small quantities of it do not modify the volume or quality of the constituent elements of blood. They do not discuss the mechanism by which arsenobenzol acts as an anticoagulant, except to state that the corpuscles and platelets are not modified in form or number and are not agglutinated. In view of the extensive therapeutic use of the arsenobenzols we have determined in detail the anticoagulating action of this type of compound on blood. We find that the addition of one part of arsenobenzol to a thousand parts of blood prevents the coagulation of blood in vitro; that a similar quantity injected intravenously into rabbits prevents coagulation for a brief period of time (less than one hour) after which normal coagulability returns; and that therapeutic doses, used in clinical cases, have practically no effect on blood coagulation except to a small degree after long courses of administration.

In the following description we consider the anticoagulating action of the arsenobenzols when (*a*) added to blood in vitro, (*b*) injected intravenously into rabbits, and (*c*) used in therapeutic quantities on man.

(*a*) *Experiments in Vitro.*

The coagulation of blood in vitro is prevented by the addition to it of 0·1 per cent. arsenobenzol. This anticoagulant action of arsenobenzol is exerted entirely on the last phase in blood coagulation—that is, on the action of thrombase on fibrinogen whereby the formation of fibrin is prevented or delayed. The following experimental results (Table I.) show this inhibitory action of neosalvarsan on the coagulation of oxalated plasma by thrombase (fibrin ferment).

TABLE I.

Oxalated plasma.	Neosalvarsan 1 per cent.	Thrombase.	Coagulation time.
2 c.cm.	0 c.cm.	0·6 c.cm.	4 mins.
,,	0·1 ,,	,,	11 ,,
,,	0·2 ,,	,,	16 ,,
,,	0·3 ,,	,,	50 ,,

Table I. shows that the time of coagulation of plasma by thrombase was extended from 4 to 50 minutes by the addition of 0·1 per cent. neosalvarsan.

The following experiments show that the enzyme thrombase is not affected by neosalvarsan. A solution of thrombase was incubated with varying quantities of neosalvarsan for 30 minutes, and the coagulating activities of the resulting solutions were then determined (Table II.).

During the incubation period of 30 minutes the neosalvarsan had full opportunity to destroy the thrombase. The coagulating activities of the mixtures when tested on oxalate plasma showed that no destruction had taken place (Table III.).

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[1] French Supplement, 1922, ii., 1177.

TABLE II.

Thrombase.	Neosalvarsan 1 per cent.	—
1 c.cm.	0·3 c.cm.	(X)
"	0·2 "	(Y)
"	0·1 "	(Z)

TABLE III.

Oxalated plasma.	—	Coagulation time.
2 c.cm.	0·6 c.cm. (X)	6½ mins.
"	" (Y)	4½ "
"	" (Z)	4 "

The slightly increased time of coagulation with (X) and (Y) compared with (Z) was due to the additional quantities of neosalvarsan contained in these fluids.

It is evident that neosalvarsan does not destroy thrombase. Therefore the inhibitory effect of this compound on blood coagulation must be intimately associated with its action on fibrinogen. Probably the neosalvarsan unites directly with the fibrinogen, and the complex thus formed is less readily coagulated by thrombase. This hypothesis is supported by the fact that all arsenobenzols do not affect the coagulability of the blood. Thus, neosalvarsan (German), sulfarsenol, and novarsenobillon are equally effective in preventing blood coagulation, but stabilarsan has no such anticoagulant action. Stabilarsan is a glucose compound of arsenobenzol. It is probable, therefore, that that portion of the arsenobenzol group which combines with glucose is also responsible for the combination of the arsenobenzol with fibrinogen. In this connexion it is of interest to observe that inorganic compounds of arsenic do not affect the coagulation of blood. Consequently the combination of the arsenic with the fibrinogen must be due to the particular grouping which is common to the arsenobenzols and which can combine with glucose as readily as with fibrinogen. The fact illustrates the rôle of the subsidiary groupings in determining the physiological action of any compound.

(b) *Experiments in Vivo.*

The anticoagulant action of the arsenobenzols when injected intravenously into animals is of the same order as that observed in test tube experiments. Thus the intravenous injection of neosalvarsan, sulfarsenol, or novarsenobillon into animals to the extent of 1 part per 1000 parts of blood immediately delays or prevents the coagulation of the blood, whilst a similar injection of stabilarsan has no effect on its coagulability. But, whereas Flandin and Tzanck describe the anticoagulant action as persisting for periods of time varying from several hours to several days, we find the effect extremely transitory. The results we obtained are illustrated in the following experiments:—

Rabbit 1.—1 cm. neosalvarsan (10 per cent.) was injected into the marginal vein of the ear = 0·1 per cent. in the blood. Samples of blood were taken from the ear vein after varying periods of time (Table IV.).

TABLE IV.

Sample of blood.	Coagulation time.
Before injection	2 mins.
10 mins. after injection	No coagulation in 24 hours.
60 " " "	2 mins.

Other experiments showed that the normal coagulation time was restored within 30 to 45 minutes after the intravenous injection of the neosalvarsan.

Rabbit 2.—3 c.cm. of neosalvarsan (10 per cent.) into the marginal vein of the ear = 0·3 per cent. in the blood. As before, samples of blood were taken from the ear vein after varying intervals of time (Table V.).

TABLE V.

Sample of blood.	Coagulation time.
Before injection...	3 mins.
10 mins. after injection	No coagulation.
45 " " "	"
60 " " "	"
90 " " "	2 mins.

Thus the coagulability of the blood returned in 90 minutes, although the amount injected would correspond to an intravenous injection of 10 g. into a normal man. With the return of coagulation an increased coagulability (positive phase) is often observed, indicating some reaction of the organism against the anticoagulant circulating in the blood.

Experiments were made to determine whether the arsenobenzols readily produced cumulative effects on the coagulability of the blood. The following result illustrates this type of experiment:—

Rabbit 3.—2 c.cm. neosalvarsan (10 per cent.) into the marginal vein of ear. Blood coagulation was inhibited for one hour, after which time normal coagulability returned. A second injection of 2 c.cm. of the neosalvarsan solution was now given. The blood became non-coagulable, but regained its coagulability in 75 minutes. A third intravenous injection of 2 c.cm. neosalvarsan (10 per cent.) was administered; 90 minutes after the third injection the coagulability of the blood became normal.

It is evident from experiments of this order that there is no marked tendency for the arsenobenzols to accumulate in the blood and thereby to produce cumulative effects comparable to the coagulation times described by Flandin and Tzanck.

Rabbit 4.—2 c.cm. stabilarsan (10 per cent.) into the marginal vein of ear. No effect on blood coagulation either immediately or half an hour later.

These observations indicate (1) that stabilarsan does not affect the coagulability of the blood in vivo, and (2) that the glucose is not split off from the salvarsan before absorption from the blood.

(c) *Clinical Observations.*

The preceding experimental work shows that the addition to blood of some of the arsenobenzols to the extent of 0·1 per cent. inhibits coagulation not only in vitro but also in living animals. But when the arsenobenzol is injected into animals the effect on the coagulability of the blood passes off extremely rapidly, probably owing to the absorption of the arsenobenzol by the tissues and its separation from the fibrinogen of the blood. The quantities of the arsenobenzols injected intravenously into the experimental animals were, however, considerable, compared with the therapeutic doses used for clinical cases. Thus, 1 c.cm. of a 10 per cent. solution of neosalvarsan injected into a rabbit corresponds with an injection of 3 g. into a man, a quantity greatly in excess of the usual maximum dose of 0·9 g. Corresponding with this fact we find that the intravenous injection of therapeutic doses of the various neosalvarsans has practically no effect on the coagulability of the blood of human beings, the maximum dose of 0·9 g. giving a concentration of only about 0·02 per cent. neosalvarsan in the blood.

The effects on the coagulability of the blood of the various organic arsenical compounds immediately after intravenous injection are illustrated by the following cases (Table VI.):—

TABLE VI.

—	Coagulation time—	
	Before injection.	10 mins. after injection.
A. Neosalvarsan (German) 0.45 g	2 min. 10 sec.	2 min. 10 sec.
B. " " "	2 " 25 "	2 " 45 "
C. " " "	2 " 45 "	3 " 5 "
D. " " "	3 " 0 "	3 " 25 "
E. Sulfarsenol 0·6 g.	3 " 40 "	3 " 10 "
F. Stabilarsan "	2 " 30 "	2 " 20 "
G. " "	3 " 30 "	3 " 40 "
H. " "	2 " 10 "	2 " 10 "

It is evident from the above figures that the intravenous injection of therapeutic quantities of the various arsenobenzol compounds has practically no effect on the coagulability of the blood. Thus the coagulation figures for stabilarsan (which does not effect the coagulability of blood) before and after injection do not differ in any marked degree from those given by neosalvarsan and sulfarsenol, both of which entirely prevent blood coagulation in vitro. Again, in some cases (F and E) the coagulability is slightly increased; in other cases (B, C, D, G) there is a small delay; and in the remainder (A and H) there is no change.

The effect of repeated injections of the arsenobenzols on the coagulability of the blood was determined. Although experiments on rabbits for short periods of time gave no indication of any cumulative effects of these compounds on the blood, yet it appeared possible that such effects might arise in human beings, especially in cases of long-continued administration. The following coagulation times were obtained before and after an intravenous injection of arsenobenzol in cases which had undergone prolonged treatment (Table VII.).

TABLE VII.

—	Coagulation time—	
	Before injection.	10 mins. after injection.
K. 6 previous injections of neo-salvarsan	2 min. 45 sec.	3 min. 5 sec.
L. 13 previous injections of neo-salvarsan	3 " 0 "	3 " 25 "
M. 20 previous injections of novarsenobillon	2 " 25 "	2 " 45 "
N. 50 previous injections of various arsenobenzols ..	2 " 20 "	3 " 30 "

Except in Case N the results offer no evidence that the arsenobenzols accumulate in the blood and inhibit its coagulability even after an extensive series of intravenous injections. Even in Case M the delayed coagulability is small and does not bring the coagulation time outside the normal limits.

Summary.

As a result of our investigations we find that some of the arsenobenzols (neosalvarsan, sulfarsenol, novarsenobillon), when added to blood to the extent of 0·1 per cent. prevent its coagulation. This inhibition is due to the action of the arsenobenzol on the fibrinogen, probably by direct combination with it. The combination of the arsenobenzol with fibrinogen depends upon the organic grouping, since arsenious oxide has no effect on the coagulability of the blood, nor does arsenobenzol combined with glucose (stabilarsan) alter blood coagulation. Arsenobenzol, 0·1 per cent., inhibits the coagulation of blood not only in vitro but also in vivo. But in the animal body the inhibition of coagulation passes off within an hour, probably owing to the passage of the arsenobenzol from the blood into the tissues. Therapeutic doses of the various salvarsan preparations intravenously injected into men or women have practically no effect on the coagulability of the blood, since these quantities fall far below the minimum amounts required to produce fluid blood. Further, the arsenobenzols do not appear to accumulate in the blood and thereby effect its coagulability, since even after prolonged courses of administration the coagulability of the blood remains normal. Hence, previous treatment with arsenobenzols, from the point of view of the blood coagulability, need not be seriously considered when surgical operations are in question.

We are indebted to Colonel L. W. Harrison for permission to determine the action of the arsenobenzols on the coagulability of the blood in clinical cases.

MARRIAGE, PREGNANCY, PARTURITION, AND TUBERCULOSIS.[1]

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THE importance of the question as to whether a tuberculous woman should marry need not be laboured. To answer it we must know what are the risks, if she does marry, to herself, her children, and her husband. Search in the literature of the subject, extensive though it be, does not provide a sufficient answer. We find series of cases, leading to different conclusions; the results of tuberculin injections, contradicted by others, and statements by great men. The text-books again do not help us much. Osler writes: "Child-bearing increases the risks from tuberculosis *enormously*," and quotes Dubois as follows: "If a woman threatened with phthisis marries she may bear the first accouchement well, a second with difficulty, a third never." But opposite opinions are stated with equal emphasis. I have heard more than one experienced practitioner express the view that marriage and child-bearing always benefit tuberculous women. By investigation of the material which comes to my notice I have attempted to throw further light on this difficult problem, and am driven to conclude that, as often happens in controversies, both schools are right, and both are wrong. In many respects my conclusions agree with those published by Fishberg.[2] First let me cite two cases illustrating a type not infrequently seen.

A woman was under treatment at 26, during three years, at a public dispensary, for tuberculosis of the lungs; she then married and bore 10 children. Marriage improved her health, as also did the first childbirth; of the other confinements some have made her worse, some better, and by some she was unaffected. To-day (at 54) she remains much as when she married; not many physical signs in the chest, a little daily sputum, in which tubercle bacilli have recently twice been found. Of her children three died from tuberculosis, three are alive but tuberculous, two have died from unknown causes, two I would pass as negative.

A woman, now aged 47, was from 16 to 18 confined to her room because of pulmonary tuberculosis. She then gradually got about again, married at 24, and has been better since. Occasionally she was worse after parturition, at other times better, mainly unaffected. Of her 11 children, three are tuberculous, and have all been in sanatoriums; four are "suspect," one dead, three are alive, but as yet unexamined by me.

For nearly three years I have been trying to collect evidence of the risks of matrimony to tuberculous women; the work is not nearly complete, and is imperfect in many respects. Inquiries are afoot which may double the number now to be quoted, but I do not think the conclusions will be materially different. Nothing elaborate is aimed at; only to say roughly whether the patient is made better or worse, or left unaffected by marriage, pregnancy, parturition, or lactation. The condition of the children was also investigated. The information was obtained by personal observations in some cases, in others by questioning, cross-questioning, and re-questioning on different occasions; the answers being checked, where possible, by collateral inquiries from relatives, friends, or the practitioner in attendance. When in doubt it is safe to say "unaffected." Only major tuberculosis is considered. There are several difficulties, the chief being to decide if the deterioration in health is due to an exacerbation of tuberculosis or to some other cause. Of the latter the principal are vomiting in pregnancy and perineal or uterine injuries and displacements after parturition; by inquiry these can usually be differentiated from tuberculosis if their existence is borne in mind. The results of hæmorrhage are not so important, as the patients often recover rapidly; if not, this may itself lead to an exacerbation of the disease. There are many tempting side tracks, but the main road will be followed, and for the sake of brevity and clearness the results are expressed in percentages.

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[1] A paper read before the Tuberculosis Society.
[2] Fishberg: Pulmonary Tuberculosis, 1922.

Marriage.

The effect of marriage alone in 125 tuberculous women was: 60 per cent. unaffected, 26 per cent. better, 14 per cent. worse. Lately I have begun to include men, but only 23 have been investigated so far; of these 70 per cent. are unaffected, 26 per cent. better, 4 per cent. worse. Thus tuberculosis is unaffected or is improved by marriage in about 90 per cent. of tuberculous women.

Bearing in mind the fact that 15 to 20 per cent. of patients may be expected to deteriorate in any period of one or two years we must conclude that marriage has, if anything, a beneficial effect on tuberculosis.

Pregnancy.

Out of 423 pregnancies in 237 women, 53 per cent. had no effect, 16 per cent. improved the patients, 31 per cent. made them worse. The clinical *onset* of disease occurred during pregnancy in about 4 per cent. of women, and of these less than half terminated fatally. Some cases are remarkably improved by pregnancy, others go to pieces, but about 70 per cent. are better or unaffected. Unluckily it is impossible to consider pregnancy apart from parturition.

Parturition.

Out of 442 labours in 240 patients, 32 per cent. left the patient unaffected, 19 per cent. made her better, and 49 per cent. worse.

The onset of disease occurred after parturition in 17 per cent. of patients, of whom nearly one-half died. If we add the pregnancy onsets it gives us 21 per cent. Apart from these onset cases, which naturally attract notice, and have considerably influenced writers on the subject, only 2 per cent. of women died as the direct result of an exacerbation caused by child-bearing; so that parturition is likely to make pre-existing tuberculosis worse, but unlikely to make it fatally so. The worst are the onset cases, which cannot be foreseen. Yet there are instances (19 per cent.) where parturition has a beneficial influence, sometimes strikingly so. A patient with chronic phthisis, almost an invalid, may suddenly pick up after the first baby, and become the mother of a large family. Sometimes we find a patient better during pregnancy, worse after the confinement, less often the reverse; the patient goes downhill rapidly during pregnancy but picks up wonderfully afterwards, although she has to look after a child. We must not underrate the mental factor in these conditions. A study of resistance to this disease in pregnancy, and after childbirth, may yet throw welcome light on the mechanism of immunity.

Miscarriage.—I have not yet fully investigated the result of miscarriages, but of 31 of these 14 (47 per cent.) had no effect, 1 (3 per cent.) improved the patient, 16 (50 per cent.) made them worse. The onset occurred after miscarriage in four of these women (12·5 per cent.), of whom one-half died. The value of induced abortion in tuberculous women seems very questionable.

Lactation.

Out of 331 cases investigated, in 197 the mother breast-fed the child for a period from a few weeks to over three years, but in only 2–3 per cent. did lactation appear definitely to cause deterioration. The patient became gradually worse long after parturition, but before lactation ceased. I expected the effect of lactation to be much more marked, but there are many points to be considered here. Nature takes good care of us in this respect; a woman too ill to suckle is generally unable to do so. Lactation may be exhausting, but it may prove even more exhausting to get up at night to heat bottles and to deal with a child made more fretful, perhaps, by artificial feeding. And the amount of nourishment withdrawn in the first six weeks is not large. There are also other more subtle considerations.

The Children.—Of the offspring from the labours already considered, 372 were traced and 290 investigated personally. Of these 45 per cent. were negative, 34 per cent. tuberculous, of whom one-quarter died of the disease; 21 per cent. were suspect. Among the children unexamined by me 42 per cent. were dead from causes unknown or other than tuberculosis. We include with these most cases where the death of infants was attributed to "consumptive bowels." Compare with this the examination of 82 controls—that is, contacts of non-tuberculous persons; 87 per cent. of these were negative, 5 per cent. tuberculous, 8 per cent. suspect.

Out of 177 children breast-fed by tuberculous mothers 35 per cent. were negative, 31 per cent. tuberculous, of whom one-fifth died, 15 per cent. were suspect, 15 per cent. unseen by me, and 4 per cent. dead from causes unknown. Among 116 bottle-fed children 32 per cent. were negative, 25 per cent. tuberculous, of whom one-fifth died, 14 per cent. suspect, 14 per cent. unseen by me, and 15 per cent. dead from unknown causes. There are pitfalls, no doubt, but on the whole the increased risk to the child from breast-feeding under these circumstances seems negligible.

As concerns the husband, space does not allow the discussion of conjugal tuberculosis here. I look upon it as certain that the husband will be infected sooner or later if not congenitally immune, or with a smouldering infection of his own.

Summary.

Summing up, we find that a tuberculous woman loses nothing by marriage alone. It is unlikely to affect her either way; if it does affect her it is more than twice as likely to improve her condition as to cause deterioration. Pregnancy and parturition are likely to make her worse; there is, however, only a 50 per cent. chance of this against a 19 per cent. chance of improvement. But the children are seven times as likely to be tuberculous as those of healthy people.

As to the advice which may be given to a patient about to marry: patients who ask for such advice will not take it unless it coincides with their wishes. If the doctor says "Do not marry," and consciously, or subconsciously, the young couple are anxious not to marry, they may abide by his decision, but not otherwise. Often enough the only result of such advice is a more hasty marriage. The best way to prevent an undesirable union is to procrastinate. The advice should be "wait," expressed in as many words as may be considered appropriate to the occasion. Each case must, of course, be considered on its merits from all points of view. My figures, moreover, apply only to the poorer classes. I am now making an attempt to secure figures from better class patients.

To relatives percentages may be given. The chief risk is to the children, and this should be emphasised. A woman of marriageable age with major tuberculosis *should not bear children.* To counterbalance the loss of gratification of the maternal instinct must also be placed the risks of deterioration to the patient. Finally as to lactation. If milk is available it is wise for a tuberculous woman to breast-feed the child for six weeks certainly, longer in many cases, but never longer than eight months, and always with precautions if she is infective.

Is it possible to estimate the risks of a tuberculous inheritance as contrasted with the risks of infection by a comparison of the children of closed surgical and open pulmonary cases? I cannot yet say, but will certainly make the attempt, although if Piéry's[3] observation be confirmed, that the sweat of patients with closed surgical tuberculosis gives positive inoculation results in guinea-pigs in 30 per cent. of cases, the difficulties will be well-nigh insuperable.

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[3] Piéry: Virulence et contagiosité de la sueur des tuberculeux, Acad. de Méd., March 26th, 1912.

BRITISH MEDICAL ASSOCIATION.

ANNUAL MEETING AT PORTSMOUTH.

(Continued from p. 518.)

SECTION OF OBSTETRICS AND GYNÆCOLOGY.

WEDNESDAY, JULY 25TH.

AT the opening session, with Mr. VICTOR BONNEY presiding, Mr. A. W. BOURNE opened a discussion on

Acute Salpingitis.

He said that his paper was confined to the treatment of acute suppurative salpingitis with pelvic peritonitis. Catarrhal salpingitis never required more than the simplest medical treatment.

Clinical Description.—This was essentially an attack of acute suppurative pelvic peritonitis, with a background of genital symptoms due to acute suppuration in one or both Fallopian tubes. The symptoms were: acute pain, tenderness, and rigidity of the hypogastrium. Moderate fever. Later there are distension of the lower abdomen, constipation, and sometimes vomiting and painful micturition. In addition there are uterine hæmorrhage, leucorrhœa, and vaginal tenderness. No definite swelling can be made out, owing to the softness of the enlarged tube and the pain of examination.

Aim of Treatment.—Mr. Bourne said that the cardinal lesions requiring treatment are: (*a*) Suppurative inflammation of the tubes, and later of the ovaries; (*b*) suppurative pelvic peritonitis. These two conditions were inseparable and could not be regarded independently. The object of treatment must be: (1) to arrest the acute disease and prevent its extension to the abdominal cavity proper; (2) to prevent the formation of chronic sequelæ; (3) to restore the tube to normal function. It was very rare for the peritonitis to extend to the abdominal cavity proper, except after full-term labour, when the tube is an abdominal organ. Pyosalpinx, chronic thickenings, adhesions, &c., produced chronic semi-invalidism with relapses of acute symptoms. Bilateral salpingitis was followed by sterility.

Pathology of Acute Salpingitis.—Sections were shown on the epidiascope demonstrating Fallopian tubes in various stages of inflammation. The lumen was at first distended with pus and the plicæ were very œdematous. In the early stages the epithelium was in a fair condition. In a few places there might be desquamation. At a later stage the lumen was clear of pus, the plicæ were still œdematous, and traces of newly-formed fibrous tissue could be seen. The epithelium was still in good condition, but the ulceration was more marked. A later stage was shown when the lesion was becoming chronic. Epithelium was poor, and the commencement of adhesions was noticeable. The plicæ were still distended with exudate. The fourth stage was that of natural resolution. There was a large amount of fibrous tissue in the plicæ, while the epithelium, though intact, showed a tendency to heaping up. It was unlikely that such cells retained their cilia. The conclusions to be drawn were: 1. That in spite of a very acute salpingitis the epithelium is remarkably resistant in the early stages, and only shows partial desquamation. 2. That after the acute phase has passed off most of the epithelium surface is intact, but what lesions there are are likely to develop adhesions. 3. Plical adhesions may be very extensive in the tube, cutting up its channel into a number of diverticula which probably harbour infection and predispose to ectopic gestation.

Treatment.—Expectant and medical methods would usually lead to a subsidence of the acute symptoms and the patient "recovered." She was left sterile and the development of chronic salpingo-oöphoritis or pyosalpinx was only a matter of time. If acute salpingitis was capable of resolution as a result of medical treatment, how did chronic interstitial salpingitis arise? The commonest operation on the tube was for these chronic inflammatory conditions and the great frequency of this disease was an indication of the ordinary sequel of the disease in an acute form. Medical methods might suffice to nurse the patient through the acute stages, but she was left with a chronic inflammatory focus in the pelvis and the prospect of years of pain, menorrhagia, and sterility. The ideal treatment was to arrest the destructive inflammatory process before the desquamation of the tubal epithelium and the formation of intra-tubal adhesions and the diverticulæ and sealing of the ostium had occurred. It was therefore important to operate as soon as the disease was diagnosed. The sooner the abdomen was opened the easier it was to restore tubal function by arresting the destructive suppurative processes. The chief objections to operation in the acute stage were: (1) that it is usually "unnecessary"; (2) that it may be dangerous in spreading infection. The first objection had already been discussed and it had been shown that surgery is necessary for the treatment of chronic tubal disease. The second objection used to be urged against operation for acute appendicitis before the fifth day. It was no more valid when applied to salpingitis than to appendicitis; probably less so as the organisms of acute salpingitis were usually of a less virulent order.

Mr. Bourne had traced 11 cases of acute suppurative salpingitis operated on within a few days of the first onset of pain. There had been no deaths, and all the cases had done well. From the arguments set forth, that medical treatment was very liable to be followed by chronic disease, and that the risk of early operation was extremely small, the case for early surgical interference appeared to Mr. Bourne to be established. Further, our knowledge of the pathological processes going on within the tube indicated that the earlier surgical treatment is undertaken the better.

The Operation.—Mr. Bourne then described the steps of the operation. The abdomen is opened and the abdominal cavity proper carefully packed off. The tubes are seen to be greatly congested, and plum-coloured, with œdematous fimbriæ and pus leaking from the abdominal ostium. Plastic lymph adheres in flakes to the peritoneal surface of the tubes, intestines, ovaries, and uterus. Organised adhesions have not yet had time to form. Each tube is slit up as far as possible along the border opposite the mesenteric attachment. The pus is very gently swabbed away, and the mucous membrane carefully inspected. Should it appear intact to the naked eye—i.e., only congested without ulceration or greyish patches of necrosis—the tube should be left in situ without any further treatment beyond a few sutures of thin catgut at any point where there is arterial bleeding. Any cyst in the ovaries should be opened freely to prevent the formation of ovarian abscess. A drainage-tube is placed to the bottom of the pouch of Douglas and the abdomen closed. Drainage may be provided through the vagina. If after laying open the tube, the mucous membrane shows patches of ulceration and gangrene it is beyond the power of functional recovery and should be removed. The only possible object of preserving the tubes is to maintain their function, and if this appears impossible, owing to the extent of their destruction, the tubes should be completely removed, as then there can be no further salpingitis, and the ovary is saved considerable risk of infection. To leave the tube alone, and merely drain the pelvis, is to invite the formation of chronic tubal disease and permanent ill-health and the formation of residual abscesses.

Mr. Bourne concluded that in the many cases of acute salpingitis occurring in young women soon after marriage, in whom the certainty of future sterility is a very real tragedy, we were apt to regard the "recovery" of the patient as the chief, if not the only, aim of our treatment. He claimed that our treatment should be designed with a view also to preventing sterility, or at least morbidity. Many of these patients would "recover" in any case. Early salpingostomy would give them the chance of subsequent pregnancy, and if already too much damaged, salgingectomy would prevent permanent ill-health.

Desirability of Early Operation.

The **President** congratulated Mr. Bourne and agreed with him. He recalled old days at the Middlesex Hospital, when these cases were admitted and treated in the medical wards. After months of illness some of these cases developed fistulæ and discharged indefinitely. Some died. Later cases were transferred to the surgical and gynæcological wards for operation. Some of the operations on long-standing cases or cases of large hydrosalpinx were most formidable affairs, owing to the extent and density of the adhesions. Dispassionately reviewing this experience, the President came to the conclusion that this old expectant treatment was all wrong. If it were dangerous to operate early, this discussion would be futile. But it was not so. For 20 years he had been operating as early as possible, and had had good results. It was now well recognised that early operation was not dangerous. The problem remained whether the possibility of functional recovery made it worth taking an additional risk to save the tube. The President had not had a large number of cases in which he had conserved the tube. In two cases he had had to operate again at a later date for chronic disease. He had not, perhaps, done such an extensive slitting of the tube. Early operation with removal of the tube was safe. Evidence now showed that slitting the tube and leaving it was also safe. Even if the "gutter" remained open there was required evidence that the uterine ostium becomes patent. A few years ago he would have said that once a tube was sealed its function was gone for ever. Now, in the face of many plastic operations, he hoped some proof would be forthcoming that this operation might be successful. Pyosalpinx and tubo-ovarian abscesses were a disgrace to modern surgery. The parallel Mr. Bourne had drawn between salpingitis and appendicitis was quite fair. Early operation in salpingitis enabled one to save at any rate the ovary.

Dr. **Carlton Oldfield** said that the important thing was to find a case where early salpingostomy had resulted in a subsequent pregnancy. He had investigated the cases at Leeds and had divided his cases into two groups; the first group was composed of cases where at laparotomy one tube and ovary had been conserved. In some of these cases the one tube appeared normal; in others it was inflamed and oozing pus, but appeared to him capable of recovery. In this series there were 17 cases. Results: no pregnancies. The other group consisted of cases of pelvic peritonitis. In these cases Dr. Oldfield performed posterior colpotomy, and did not open the abdomen. There was pus or serum in the pouch of Douglas. In this series there were 30 cases. Result: one pregnancy. A point in favour of early operation which had not been emphasised was that the salpingitis was frequently unilateral at first, and removal of the diseased tube might save the other.

Dr. **John Campbell** said he had strongly advocated early operation at the discussion at Glasgow last year. The difficulty was to get these cases early. But that difficulty had been largely overcome when applied to the appendix, and it was only necessary to train the profession and the public. As regards the operation itself, a weak point in the slitting up the tube was the necessity for drainage. The drainage-tube must cause adhesions. The operation of colpotomy did not come into this discussion as it was useless for acute cases. Was there any evidence that slitting open the tube predisposed to extra-uterine gestation?

Prof. **R. W. Johnson** did not agree that acute salpingitis was parallel to acute appendicitis. In salpingitis there was an inflammation of the whole genital system, and the disease itself was not dealt with by slitting and draining the tubes. One might as well open Bartholin's gland for acute gonorrhœa. The sterility was probably due to damage done to the whole genital tract by gonorrhœa. There was some danger in early operation. There was not necessarily a large mortality, but there must be some cases where the infection was spread locally, or where general septicæmia developed.

Mr. **Leonard Phillips** read a description of 25 cases of sterility due to sealed tubes resulting from a previous salpingitis. The lesions found varied. In some the abdominal ostium was sealed. Others had definite strictures in the length of the tube, and in others there was a stricture of the uterine ostium. The patients complained of sterility, and many of them had the cervix dilated for this. They gave a history of previous salpingitis, but had no symptoms when seen by Mr. Phillips. The conditions described were seen, as they were all cases on which he had performed abdominal section for plastic operation on the tubes. Of this series there were five cases who had subsequently become pregnant. Mr. Phillips demonstrated by diagrams four different types of operation for the different lesions he had found and described the operations in detail.

Dr. **Gilmore Currier** showed an apparatus for passing gas through the cervix to determine the patency of the tubes. The apparatus consists of a "sparklet" bulb, a steel bulb containing compressed CO_2 and a high pressure valve for controlling the flow of gas, which is led by a tube to a water meter and thence to a hollow uterine sound. Connected to this is an ordinary mercury manometer. The hollow sound is made of pure tin and can be bent into any desired shape. A certain distance from the end is a rubber "acorn" which, by being pressed against the external os, prevents the regurgitation of gas. With the usual surgical precautions the sound is passed and the gas turned on slowly. The pressure rises in the manometer. If the tube is patent the pressure does not rise above about 80 mm. of mercury. There are slight variations in individuals. By the meter it can be observed that gas is passing into the abdominal cavity. This can be confirmed by X ray. If the tube is not patent the pressure gradually rises. It is not advisable to allow the pressure to go above 200 mm.

Mr. **L. C. Rivett** had seen a demonstration of Dr. Currier's apparatus and had observed the difference when the air passed through the tubes or was held up. It would obviously be of great value in the cases recorded by Mr. Phillips, both in diagnosis and in inflating the tubes during laparotomy. As regards Mr. Bourne's paper, Mr. Rivett was in agreement with this method. He was not sure that it was necessary to remove the tubes, even when definitely damaged, as Mr. Phillips's cases proved that it was worth conserving a tube whenever possible; even if resolution was not sufficiently complete to leave it patent, this could be remedied at subsequent operation. The danger of septic secondary hæmorrhage in the delayed operation had not been mentioned. The risk was absent in the early operation.

The **President**, in calling on Mr. Bourne to reply, said that there was not the clear consensus of opinion that he had hoped for. He was disappointed that there was no case recorded where early salpingostomy had resulted in a subsequent pregnancy. Mr. Phillips's results were remarkably good and he could not help thinking Mr. Phillips had been a little lucky. The President was interested in Dr. Currier's apparatus and thought it would be most useful.

Mr. **Bourne** replied.

THURSDAY, JULY 26TH.

Mr. **Comyns Berkeley** opened a discussion on the

Use and Abuse of Forceps.

He drew attention to the unsatisfactory position of the forceps operation to-day. The blame was not all on the family doctor and the teachers of obstetrics must shoulder their share. The General Medical Council could prescribe more stringent rules and regulations. The majority of students were not going to operate when they got into practice, and yet, before they could sit for their final examination, they must spend three months in the out-patient and six months in the in-patient surgical departments of their hospital. The majority of students were going to practise midwifery, and yet many of the examining bodies did not compel them to attend any cases in hospital, and there was no rule that any of the 20 cases should be delivered under the immediate supervision of the chief of the department. The only way to obtain a real knowledge of the bad results of midwifery, and among other things the abuse of forceps, was to attend the practice of the gynæcological ward, and yet this was not compulsory. The whole difficulty in teaching obstetrics was that of obtaining sufficient material. There are far too few lying-in hospitals, and the few obstetric beds in general hospitals are often filled with difficult and abnormal cases. In the medical and surgical wards one patient was available for the study of many students, but in the obstetrical wards one patient was only available for one student. A proper hospital obstetric service was an absolute essential to the efficient teaching of midwifery.

Ante-Natal Treatment.—The true conduct of labour began with ante-natal treatment. Although the forceps on occasions must be and should be used, the less frequently this instrument was employed the better. The proper way to accomplish such a reduction is by efficient ante-natal supervision.

No doctor should agree to attend a woman in labour unless he was prepared to examine her on occasions, more especially in the last few weeks of pregnancy. It was not compulsory for a student to attend the ante-natal department, always supposing there was one. Many men do not mind admitting that they were not always sure whether the head of the child was engaged or not, and yet the head remained the best pelvimeter we had got. The better the doctor was at abdominal palpation, the fewer vaginal examinations he had to make.

The forceps was used most frequently for inefficient pains and disproportion between the head and the pelvis. Proper ante-natal supervision, by getting the patient into as good a state of health as possible, could do much to help the efficiency of the pains. Proper ante-natal examination would lead to the detection of disproportion between the head and the pelvis, of malpresentation, and of those cases of minor contraction in which the head of the child was not engaging as it should—a knowledge of which might easily avoid the abuse of forceps. A man in general practice had very little need to perform surgical operations, but many of the operations in midwifery he had to perform, whether he liked it or not, whilst the public expected him to use forceps as a matter of course, and this without a proper training. In most surgical operations the surgeon made ample arrangements, and was well paid. In the majority of forceps operations arrangements were not made beforehand and the doctor was certainly not well paid.

It was impossible to sterilise the vagina. It was therefore impossible to pass anything into the uterus, be it fingers, hand, or forceps, without potentially infecting it; and moreover from the darkness, warmth, and serum present the uterus rivalled in its ability to encourage the growth of pathogenic organisms any suitably prepared culture-tube in a bacteriological laboratory. If a non-operating practitioner performing a small operation found a big one was necessary he would get expert help. The trouble was that an ordinary pull with the forceps having failed, the doctor did not realise that he was up against something serious. He did not get help, but pulled all the harder. It might be impossible to obtain an anæsthetist, but there was no reason why rubber gloves should not be carried in every midwifery bag, and there was no difficulty in shaving the vulva or in applying an antiseptic. He feared that in the majority of cases rubber gloves were not worn, nor was the vulva shaved. With the ordinary operation the surgeon was not persuaded by the patient or her relations to operate; on the contrary, the strongest objections might be raised by the one or the other. But the doctor attending a confinement was liable to be constantly reminded that Mrs. So-and-So had instruments and labour was terminated quickly and easily. That the forceps was often used unskilfully was due to the fact that, in the past at any rate, a large number of men had not seen them employed before going into practice.

Methods of Using Forceps.—The methods of using the forceps were open to abuse. The instrument could be used as a tractor, compressor, rotator, lever, and stimulator. In Mr. Berkeley's opinion the only warrantable use to which the forceps should be put was that of a tractor. Certainly there were better and safer ways of stimulating uterine contraction. None, except the most ignorant, would in these enlightened days think of using the forceps as a lever. All the cases which he had known, in which such a use had been made of the instrument ended disastrously for the mother, either in fearful laceration or in her death. He knew that many practitioners thought that in cases of persistent occipito-posterior positions, rotation with the forceps is a good method of treatment, and it was often used as a first choice. In nearly every case, especially where the patient had been watched carefully in the early stages of labour, it was possible to rotate the head and shoulders with the hands. The child certainly was more likely to be injured with rotation by the forceps, and he had seen most serious laceration of the mother. To use forceps to make the diameter of the head smaller—that is, as a compression—was absolutely wrong. This instrument must exert a certain amount of compression unfortunately, but this must be avoided as far as possible by allowing its handles to remain loose at frequent intervals. There remained traction, the one proper use to which this instrument could be put. Even this use was frequently abused. The force used should be strictly limited. There existed doctors who stated that they had to pull with all their strength, perhaps with the aid of one foot against the bed. If great force had to be used, it is a sure indication that forceps was not the right treatment. It was an abuse to apply forceps too soon—that is, before the cervix is fully dilated, either by Nature or, in cases of necessity, by hand; or in cases of disproportion, before the head had had time to mould. To apply the forceps in exhaustion of the uterus, or after the death of the child, was to apply too late. It was not fair on the forceps to use it before emptying the bladder with a catheter, neither was it fair on the patient. A vesico-vaginal fistula might easily result in the absence of such precaution, and yet some people were so apt to forget this that they always kept a catheter tied to one blade of the forceps. Lastly, if difficulty was experienced in applying the forceps by one who was accustomed to use this instrument, this was generally an indication against the operation.

Advocates of frequent use of forceps claimed that it shortened the woman's suffering. Was this worth the increased risk? Many asserted that they get less tears, but laceration of the vaginal walls and cervix might not be recognised, and Mackenrodt's ligaments were often badly stretched. It was more difficult to maintain asepsis if forceps was used. Those who were in charge of lying-in and gynæcological beds were constantly having brought to their notice the disastrous results of the unskilful use of forceps—such as rupture of the uterus, rupture of the vagina, fistulæ of the bladder and rectum, whilst fracture of the pelvis was not unknown. During the last year Mr. Berkeley knew of two cases in which the blades of the forceps had been forced through the vaginal walls and applied outside the lower uterine segment.

Indications for Forceps.—A doctor should never use the forceps merely to suit his own convenience; such use, to say the least of it, was unscientific. The rule that if a primigravida had been in the second stage of labour for over two hours, or a multipara for over an hour, she should be delivered was a most pernicious one. If the delay was due to inefficient pains, forceps should be used when they were becoming inefficient; when they had ceased post-partum hæmorrhage was lurking round the corner. If the delay was due to slight disproportion accurate diagnosis was of utmost importance. External measurements of the pelvis mostly indicated the shape, and the diagonal conjugate only showed gross contraction. In medium contraction the practitioner should not interfere unless he is forced to do so. He should be guided by the condition of the mother and child, and if this was satisfactory he should hold his hand. It was far better that the second stage of labour should last six hours than that the mother and child should be injured or killed. If the head was movable above the brim forceps should never be employed. If there was the least doubt about the head being able to pass the brim, forceps should not be used, as this only increased the danger if Cæsarean section was decided upon. Munro Kerr had reported that since the abolition of "high forceps" in the institutions with which he is connected spontaneous delivery had become more common.

Dr. John Fairbairn said that too much reliance had been placed on the forceps. Our first line should be to investigate and treat so that patients should have a normal labour. Ante-natal supervision should eliminate malpresentations and misfits. Once the doctor had satisfied himself that everything is normal the greater part should be left to the midwife, and the doctor, with the rattling bottle of chloroform, should be kept in the background. Hypnotics should be given if required. The fees now paid were too small, and the general practitioner cut the loss by time-saving devices which were equally appreciated by the patient. Mr. Berkeley had suggested that the teachers should supervise the students. Dr. Fairbairn did not agree; he considered that this would be using a steam hammer to crack a nut.

The President (Mr. Victor Bonney) agreed with the views expressed by Mr. Berkeley and Dr. Fairbairn, but they were idealistic. The lot of the general practitioner was hard, and unless he pleased his patients he lost custom; patients and relatives constantly pressed doctors to get on. The President had always advocated that obstetrics should be more surgical. It should be properly paid and properly arranged for. Full dilatation of the cervix was a misunderstood term. It was generally interpreted to mean the cervix sufficiently dilated to allow the head to come through; the term should be altered to "head *through* cervix." In regard to abdominal palpation, it is always a matter of opinion whether a head would come through. Anyone might make a mistake, and when it was found that the head would not come through, the mistake should be admitted and no attempt should be made to use undue force. Sometimes other methods of delivery should be adopted. Perforation was not done often enough when forceps failed after a reasonable chance. The woman should be left fit to bear another child.

Dr. T. A. M. Forde thought that the provision of more beds could only be realised by establishing special lying-in hospitals. Lunacy and fevers were already learnt by the student outside the teaching school and midwifery should be on the same basis. There should be more opportunities for post-graduate work.

Prof. R. J. Johnstone said he agreed that the teaching was poor, but when he had suggested that every student should *see* five obstetric operations before being signed up, it was turned down by the teachers, who said they had not time or cases. Puerperal sepsis often occurred when forceps had *not* been used. This was not a matter for congratulation. The perineum should be more efficiently cleaned up in normal deliveries.

Dr. H. B. McCaskie said that from the general practitioner's point of view these ante-natal precepts were rather disturbing. Practitioners often came home at 4 A.M., congratulating themselves on having saved two lives. Now it appeared they should regret that they did not examine the case a month before. The general practitioner did not see much sepsis after forceps.

Dr. C. E. Douglas gave an excellent description of the life of a country practitioner in Scotland.

Colonel A. Buchanan showed some models which he was demonstrating in the afternoon, and pointed out how they indicated when to use forceps.

Many other speakers, including Mr. R. A. Hendry, Dr. J. Campbell, and Mr. L. C. Rivett took part in a very interesting and full discussion, and Mr. Berkeley replied.

SECTION OF RADIOLOGY AND ELECTROLOGY.

Wednesday, July 25th.

Dr. Gilbert Scott (London), President, introduced Dr. R. W. A. Salmond (London), who read a paper on the

X Ray Examination of the Urinary Tract.

Dr. Salmond in his opening remarks said that the success of X ray examination of the urinary tract depended upon two main factors: (*a*) proper technique, and (*b*) accurate interpretation. Under the head of technique the speaker directed attention to the undermentioned points: (1) The apparatus used should be capable of making the correct exposure in a fraction of a second, or in two or three seconds at the most. It was possible to do good work with longer exposures provided the kidneys were kept at rest by efficient compression. In any case compression should be used. (2) Preparation of the patient should consist in a regimen of light diet for two or three days, with an aperient on the two evenings preceding the examination, followed by an enema on the day of the examination. (3) The tube should have just sufficient penetration to get through the parts. (4) The film should include the last two ribs and iliac crests and the back should be in close apposition to the film. (5) The central ray should be directed through the level of the second lumbar vertebra with the extension tube pointing under the costal cartilages. (6) In all cases the whole urinary tract on both sides should be examined. (7) In the examination of the ureters the tube should be parallel with the film. (8) In examining the bladder the tube must be tilted in such a way that the extension tube points well into the opening of the pelvis so that the pelvic bones do not hide any shadow at the base of the bladder. (9) The Potter-Bucky diaphragm gives excellent results in these cases.

Under the head of accurate interpretation Dr. Salmond said that in all cases where a doubtful shadow is found confirmatory films should be taken on another day after further purgation. Lateral views of the kidneys could be taken to show better the relation of the shadows to the kidney or ureter and were especially useful in differential diagnosis. In stout people the outlines of the kidneys were best shown by inflating the perirenal fat with 200–600 c.cm. of oxygen or CO_2. The kidney could also be shown by inflating the peritoneum and this method was good for showing renal tumours, though not free from danger. The most simple and the safest method was to pump air into the colon, a method which was also painless. Pyelography consists of injecting an opaque solution into the pelvis of the kidney through a ureteral catheter. 10–20 per cent. solution of sodium iodide or bromide is generally used. Collargol should be avoided, being too irritating. Pneumo-pyelography is a similar method except that oxygen is used instead of the solution. It does not obscure stones as does the opaque solution. To demonstrate the bladder it should be filled with a 10 per cent. solution of sodium iodide or an emulsion of barium and oil. Diverticula and calculi can be seen, but films should be taken at different angles.

As regards diagnosis, the normal size of the kidney must be clearly visualised. Marked difference of the two sides was pathological. Kidney stones were shown superimposed on the kidney shadow and always had the same relation to it on movements of respiration. However, the pelvis and calyces were usually characteristic. Viewed laterally they were seen superimposed over the bodies of the first to the third lumbar vertebræ. Shadows in the kidney area might be due to intestinal contents, calcified glands, calcification in a tuberculous or malignant kidney, or to foreign bodies. Calcified glands generally presented a mottled appearance and had extreme mobility; the lateral view showed them in front of the vertebræ. Gall-stones usually showed a clear central nucleus and denser peripheral area, and these moved vertically on respiration. Multiple stones were characteristic. Stones in the ureter were usually small and oval. They might travel up and down the ureter. Calcified abdominal glands, accessory epiphysis for the tip of the transverse process, concretion in the appendix, phleboliths, might all be mistaken for ureteral calculi. When a diagnosis could not be made it might be necessary to pass an opaque bougie up the ureter. Vesical calculi were usually larger than renal ones and were generally oval in shape. Often they showed different densities due to the deposit of layers of different chemical compositions. Diverticula were demonstrated by filling the bladder with an opaque solution and taking films at different angles. After the fluid was voided the diverticulum might remain filled. The differential diagnosis of vesical calculi was to be made from prostatic calculi, fæcal masses, calcified fibroid, dermoid cyst, and foreign bodies. In the detection of urethral stones the tube must be well tilted to avoid the pubic arch. For these the commonest site was the prostatic urethra, but stones might be found in any part of the urethra and might be formed by phosphatic deposit behind a stricture. Uric acid stones would not cast a shadow, and radiologists should mention this in reports on negative cases. All other stones threw a definite shadow. Calcium oxalate cast the densest shadows, then phosphatic deposits, and lastly those composed of urates. Cystin and xanthin stones gave a shadow due to the contained sulphur element. Stones were frequently found in infants and children and might produce no symptoms for years. With the proper technique and assistance of the more elaborate methods and with accurate diagnosis in collaboration with a urologist there is no doubt that the value of X rays in urinary diagnosis, especially as regards the presence or absence of a stone, is of the very highest importance.

Mr. R. OGIER WARD (London) pointed out that, contrary to the usually accepted opinion, pyelography was neither difficult, dangerous, nor painful; though it might be tiresome perhaps to the radiologist and the patient. He did not approve of the administration of an anæsthetic, the sensation of the patient being an important guide. The solution recommended was 20 per cent. sodium bromide injected at body temperature. Mr. Ward said the chief use of pyelography was in the determination of the condition of the kidney. He also mentioned that X rays were of value in ascertaining the presence of prostatic calculi.

Dr. L. A. ROWDEN (Leeds) advocated the merits of screen examination with palpation, and pointed out the following advantages of this method: (1) correct quality of rays for the particular case in hand can be obtained; (2) the kidney triangle can be accurately illuminated; (3) the movement and position of any shadow or shadows can be noted; and (4) the shape, size, and density of any shadow can be observed and also whether the object causing it is nearer to the anterior or posterior abdominal wall. He referred to a paper published by him in 1910 on the value of screen examination in the diagnosis of renal calculus and said that since that time they had found it of the utmost value. Dr. Rowden prepares his patient for three days, giving a light diet and a vegetable aperient sufficient to cause two or three loose motions a day. He deprecated the use of enemata as having a tendency to form gas in the colon. He pointed out that the skin of the lumbar region should be examined for pigmented moles, as these may cause a slight shadow. The patient should be placed on the X ray couch face downwards, with a cylindrical air cushion under the abdomen just below the costal margin. The X ray tube is placed under the couch in a large lead-lined box which is free to move in any direction on wheels. The diaphragm should be fixed, small and tubular, and by running the tube-box up and down the couch and from side to side the whole of the kidney area can be quickly examined. A calculus which can be quite distinctly seen through a very small diaphragmatic opening rapidly disappears when the opening is enlarged. Certain fallacies may occur with this method, and Dr. Rowden pointed these out and indicated how they might be avoided. He said that shadows not caused by calculus within the renal triangle may be due to: (1) calcareous mesenteric glands; (2) calcareous retroperitoneal glands; (3) foreign bodies, as pills, scybala; (4) calcareous deposits in lower costal cartilages in old people; (5) phleboliths; (6) calcareous deposits in a tuberculous kidney; (7) pigmented moles on the back; (8) mottling of the renal area due to gas in the intestines; and (9) gall-stones.

Dr. G. B. BATTEN (London) gave details of an interesting case of renal calculus with several stones on one side and a large one on the other.

Dr. JAMES METCALFE (London) emphasised the importance of correct technique and insisted that the film was more accurate than any visual observation could possibly be. Dr. Metcalfe also referred to the work of Dr. Carelli, of Buenos Aires, in perinephritic injection of oxygen and carbon dioxide. Dr. Metcalfe bore testimony to the use of the Potter-Bucky diaphragm in renal radiography, especially in fat people.

Dr. R. MAITLAND BEATH (Belfast) showed diagrams of, and drew attention to one of the conditions in which pyelography was of great value. This condition consisted of a kinking of the ureter with an abnormal renal artery bending round it and compressing it. Without pyelography it is doubtful if this condition would have been recognised, but having been diagnosed by this means the artery was divided and the condition relieved.

The PRESIDENT, in summing up, dealt with the subjects and with the questions that had been raised in an extremely practical manner. His chief points were as follows: (1) Preparation of the patient—i.e., castor oil the night before, and light diet. (2) Efficient compressor and efficient compression. He used a sugar-loaf cushion filled with picked lamb's wool. This was passed just under the costal margin and pressure applied. (3) The tube above the patient. (4) Length of exposure. In connexion with this he said that lightning rapidity was not essential. (5) The extreme value of showing the renal outline. (6) Perirenal inflation, which he said was not done often enough. (7) Team work between the surgeon and the radiologist should be encouraged.

Dr. SALMOND replied briefly, and said that in his experience he had found that gall-stones were not homogeneous as quoted by Dr. Rowden, but that they were less dense at the centre.

THURSDAY, JULY 26TH.

Dr. GILBERT SCOTT (London) surrendered the chair to Dr. W. J. TURRELL (Oxford), who thereafter presided until the close of the meeting. Dr. Turrell announced three papers on

Medical Diathermy.

Dr. E. P. CUMBERBATCH (London) said that medical diathermy could produce therapeutic results that no other form of treatment could effect. At present there was a pressing need of larger and more powerful machines; with electrodes measuring 8 in. by 4 in. the current density was low, even if the machine were used "all out"; larger electrodes than these were required for abdominal work, but with the present machines there would be very little heating effect. Air spark-gaps with mica washers became too hot with prolonged use and the current was cut down. Gaps working in an atmosphere of gas, and which could be regulated while working, were preferable, but in these there was an accumulation of soot, so that they required cleaning after about ten hours' use. It would be an advantage if the metal surfaces of the gap could be replaced when worn, as they corroded and became uneven after much use. In treating the abdomen the current had little resistance to overcome, so that the amount of heat generated was small, and it was quickly conducted away owing to the abundant blood-supply of the organs. When a thermometer was placed in a deep sinus in the kidney region following a nephrectomy no rise in temperature was recorded, although the current was passed for 20 minutes at 1·2 ampères, the electrodes measuring 8 in. by 4 in. Fürstenburg and Schemel measured the heat generated in the stomach with a special instrument. Using 12 in. by 8 in. electrodes and a current of 0·3 ampères the maximum rise was 0·4° C., and with 2 ampères a rise of only 0·1° C. was obtained. It was possible that strong heating of the skin sensory nerve-endings caused a reflex stimulation of the deep circulation, so that the heat was more rapidly conducted away. It must not be assumed, therefore, that maximum current and maximum heat produced the best results. In the case of mucous membranes the low resistance required a stronger current to produce the same degree of heat.

Good results had been obtained in the treatment of gonococcal infection of the joints and other parts. Nagelschmidt claimed excellent results in treating angina pectoris; and præcordial pain in arterio-sclerosis had been relieved by the application of diathermy to the heart region. Bordier spoke highly of its use in the treatment of cold paralysed limbs in anterior poliomyelitis. It was most valuable in the treatment of pains and spasms accompanying hæmorrhoids when applied by means of a rectal electrode.

Diathermy was an efficient means of treating dysmenorrhœa by relieving the congestion and spasmodic contraction. Bordier treated one case by placing one electrode in contact with the cervix, the other being on the hypogastrium. It should also be tried in para- and peri-metritis.

Diathermy had been tried by workers in the U.S.A. and in Germany for pulmonary tuberculosis, and it had been said that the symptoms were greatly relieved. If it possessed any therapeutic action it must be due to the increased blood and lymph flow and not to any germicidal action, as the temperature employed was not sufficient to kill the bacilli. Hypothermia, local and general, neuritis, and high blood pressure are all amenable to this treatment.

Dr. C. A. **Robinson** (London) amplified the remarks of Dr. Cumberbatch on the use of diathermy in the treatment of gonorrhœal rheumatism. He had treated some 120 cases, 18 of which were confirmed bacteriologically, and he was convinced of the utility of the current in this disease. It was necessary to treat not only the joint, but also the focus of infection; in fact, it was in all probability this latter which was the more important. He deduced this from his observations in cases of gonorrhœal arthritis in the female, in which the cervix only had been treated. Dr. Robinson, in these cases, gave three to five treatments bi-weekly, from 500 to 1000 milliampères, the uncovered portion of the sound measuring ¾ in. if for the cervix, and 1½ in. if for the urethra. In the male the application was made to the prostate, and sometimes to the urethra, though this latter method had not been so satisfactory. Dr. Robinson used the pure tin electrode for the cervix; in cases of gonorrhœal epididymitis he used a soft lead electrode. Satisfactory results had followed all these applications.

Dr. F. Howard **Humphris** (London) read a paper enlarging upon the use of medical diathermy in the reduction of high blood pressure, in pneumonia, and in tuberculosis, both of chest and joints. In hyperpiesia—that is, in the pre-sclerotic state, which might exist without any sign or symptom—medical diathermy administered on an auto-condensation couch might check the process of degeneration and prevent arterio-sclerosis taking place. Dr. Humphris gave a group of symptoms, chiefly functional, which might indicate a commencement of arterial change. There might be, he said, attacks of transient giddiness, a heavy oppressive fullness in the head, headache often intensified with effort of mental concentration ("the sign of painful thought"), or the headache might be pulsatile in character; there might be insomnia or drowsiness, especially in the morning, with a disinclination to work and an inability to concentrate the attention, alternating perhaps with an irritability of temper and occasionally with a mild psychic exaltation with a confusion of ideas; failure of memory, noises in the ears, migraine or neuralgia, general nervousness with anxiety, or a sense of impending evil impossible to define.

The way in which the current acted in lowering blood pressure could be said to be twofold. One, the general or constitutional effect as affecting metabolism, and the other, the local effect as on the vasomotor system. These had been demonstrated both chemically and clinically. He pointed out that even when arterio-sclerosis was established, by the use of this current a patient could be kept in a condition of safety. Dr. Humprhis urged the use of diathermy in cases of pneumonia. The treatment, he said, was a rational one and one not difficult of application. The electrodes measured about 5 in. by 3 in., and one was placed on the back and one on the front of the congested area. With the heat applied directly through the pneumonic patch a dilatation of the vessels, and consequently a decongestion, took place. The increase in temperature was beneficial, probably because it exercised a deleterious effect upon the bacilli causing the disease. A few treatments appeared to cause a rapid amelioration of the symptoms. Notably the breathing became easier and the cyanosis lessened, indicating that increased air absorption by the lungs was taking place and the heart was better able to perform its functions, owing to the diminished resistance in the pulmonary circulation.

He wished to associate himself with Dr. Cumberbatch in his remarks on pulmonary tuberculosis, and indeed in tuberculosis of bone as well, and this again, he thought, was due to the fact that the current caused a rise in temperature in the tissue through which it passed. Certainly the local increase in temperature, with the resultant improvement in the circulation and lymph flow, favoured phagocytosis, metabolism was more active, toxins were eliminated, and with the diminished fighting power of the bacillus and the increased resistant power of the body the current assisted a return to normal in the tuberculous areas. The method of treatment of tuberculosis is deserving of fair trial, and it would certainly seem to offer symptomatic relief and possibly a radical cure. Other countries, as Dr. Cumberbatch said, were trying it, but in so important and urgent a matter as the treatment of tuberculosis by electricity why should other countries lead?

Dr. **Turrell** said that the secret of success in medical diathermy consisted in administering currents of moderate intensity for long periods, such as 40 minutes or an hour, and not in giving intensive treatments of short duration. He said that the object in administering medical diathermy was not merely in order to heat the tissues by the conversion of electrical energy into heat energy within the body, but in order to obtain the consecutive effects of this heat, namely, the relaxation of spasm, the increased tissue drainage, the increased nutritional effects, &c., which were brought about by the increased blood-supply resulting from the generation of heat within the tissues in the body. There was a mass of experimental evidence that the abdominal organs were heated by diathermy in the same manner as any other organs of the body, though not perhaps to the same extent, for owing to their more free blood-supply there were larger numbers of hydrogen- and hydroxyl-ions present. Their conductivity was therefore higher and their resistance lower, consequently they retained heat less than the other organs. Moreover, not only were the abdominal organs very efficiently " blood cooled " in this way, but they were very directly affected by the heat regulating mechanism of the body, as was well shown by the experiment of Fürstenburg and Schemel quoted by Dr. Cumberbatch. Teleman, as early as 1911, experimentally heated nearly all the organs of the body in animals by diathermy. The experiments of Berndt and Preyss on animals afforded further proof of the heating effects of the diathermy currents on the abdominal organs. These two workers pointed out the danger of overheating the intestines by diathermy when they were distended with gas. In such cases they found that there was a danger of a great intensity of current on the inner coating of the intestine, and that this caused in some of their experiments a necrosis of the intestinal folds.

The time had arrived, Dr. Turrell said, when we should discuss diathermy not in relation to its action in isolated cases and diseases, but rather in relation to its mode of action. In this way we should better realise what a very wide range of application it possessed. We should not turn to an index of electrical treatment and look up Neuritis—diathermy; Chilblains—paraffin wax bath; Acne—ultra-violet radiation, but we should ask ourselves, would this case of spasmodic dysmenorrhœa be relieved by the relaxation of spasm consecutive on diathermy? Would this unresolved pneumonic lung be improved by an increased arterial blood-supply and accelerated tissue drainage, and could these results be secured by diathermy? That, he submitted, was the scientific method; and if we adopted it we should soon recognise in what a large number of cases the consecutive effects of diathermy are beneficial. Dr. Turrell said that in cases of arthritis of the hip he is in the habit of using electrodes 20 by 10 cm. with 2 ampères for 40 minutes once a week for a year, this having a prelude of daily treatments for a short time, then treatments three times a week, then twice a week before commencing the weekly régime. In dysmenorrhœa and coccydynia he had found diathermy very useful. Pain in hæmorrhoids he had seen relieved even after it had existed for four years. In fact, he foresaw the time when no ward in a hospital, either medical or surgical, would be complete unless there were a diathermy apparatus installed therein.

Dr. **Batten** pointed out how the diathermy currents had a definitely deleterious effect on the growth of the bacilli. He had had good results in the application of diathermy to the tonsils in cases where tonsillectomy was contra-indicated. He endorsed the opinions of the previous speakers on the value of this current in hæmorrhoids, and said that, speaking from an experience of 25 years, he knew of cases that had remained well for four or five years, with absence of pain.

Colonel C. B. **Heald** (London) agreed with all that Dr. Robinson had said in regard to gonorrhœal arthritis. He had also had uniform success in the treatment of cold limbs occurring in the different forms of paralysis, especially anterior poliomyelitis, and he instanced one case which was of 14 years' standing. Colonel Heald emphasised the need of educating colleagues who knew much medicine but needed enlightenment in electrical matters.

Prof. S. **Russ** (London), in discussion, remarked upon the desirability of extending the observations with diathermic currents of still higher frequency than were at present used. He also thought that it would be useful to refer to the current passing through the tissues in terms of the current density, which was a rather more exact specification. It was worth noticing that even with the same current density the rise in temperature in the tissues would be greater with large electrodes than with small, owing to the smaller proportionate heat dissipation. In cases where the rise in temperature was very small it would still be of interest to know whether any physiological effects were observed, and if so the question would arise as to whether these effects were in any way due to the oscillatory magnetic field. The effects of magnetic fields of lower frequency had been studied to some extent, practically the only substantiated physiological effect being that upon the eye.

Dr. **Agnes Savill** (London) stated that she had some experience with the treatment by diathermy of gonorrhœa in women, combined with ionisation, and recently had two cases that had responded well to this method, when curettage and treatment in skilled hands by the more established methods had failed. Dr. Savill used a copper electrode and 1 ampère for 10 to 12 minutes, which was followed by immediate improvement. Her results were checked by bacteriological examination.

Dr. **Florence Stoney** (Bournemouth) reported good results with diathermy in Raynaud's disease, chilblains, and in the reduction of high blood pressure.

Mr. **David Lees** (Edinburgh) had had experience in the treatment of gonorrhœa in women and gonorrhœal infection of the prostate, and in a case of acute prostatitis thought that it should be tried, and he would expect at least symptomatic relief. Mr. Lees thought that it would also seem to be a reasonable remedy for ophthalmia neonatorum, and asked if it had ever been used.

Dr. **Robinson**, in reply, said that he would certainly like to see it used in gonorrhœal ophthalmia. It would be eminently easy to apply, and it afforded a rational means of cure. He would also like to see it employed in cases of malignant endocarditis. Many of these cases were due to the gonococcus, and as nothing else was of much avail he thought diathermy should be tried.

SECTION OF VENEREAL DISEASES.

Friday, July 27th.

With Sir **Archdall Reid**, President of the section, in the chair, a discussion was opened by Mr. **Kenneth Walker** (London) and Dr. **David Watson** (Glasgow) on the

Prevention and Treatment of Chronic Gonorrhœal Prostatitis and Vesiculitis.

Mr. **Kenneth Walker**, who dealt mainly with chronic prostatitis, drew attention to the importance of the prostate as a gateway by which organisms entered both the blood and the lymphatic stream. As a rule, prostatitis and vesiculitis were associated conditions, and considerable confusion in diagnosis between them frequently occurred owing to the fact that the vesicles lay along the upper edge of the prostate in a horizontal position, and to the examining finger induration of the vesicles was, as a result, mistaken for induration of the prostate. However, as the treatment of the two conditions was in the main the same, errors in diagnosis were not of great importance. Of all the therapeutic measures available in the treatment of chronic prostatitis, prostatic massage was the most important. In his opinion the emptying of the follicles brought about by massage was achieved *indirectly* through the contraction of the muscular coats of the prostate rather than by *direct* pressure from the massaging finger. In order to see whether electrical stimulation of the prostatic muscle would prove as efficient as digital massage, he had been experimenting in the venereal department of St. Bartholomew's with a slowly interrupted faradic current applied to the prostate by an electrode in the rectum. Good results had also been obtained with a similar electrode and diathermy, but it was too early yet to say whether electric stimulation of the prostate was as efficacious as digital massage. Another method of treatment that was extensively used was dilatation of the posterior urethra by the passage of large-sized bougies or of special dilators. The bougie probably acted in a similar manner to massage in stimulating the prostate to contract. A Kollman's dilator should, in the speaker's opinion, never be used in the posterior urethra, as it was anatomically impossible to achieve a uniform dilatation of such a complicated cavity as that of the posterior urethra. Already a reaction was taking place against what he would term the great metallic age in the history of the treatment of gonorrhœa. Chronic gonorrhœa was a deep-seated infection, and increasing the variety of urethroscopes, dilators, electrodes, and flushing bougies that were available to the urologist would not lead to final victory. This would be achieved through the biochemist and the bacteriologist rather than with the help of the instrument maker. Although the vast majority of cases of chronic prostatitis finally yielded to patient and prolonged treatment, in a few cases the speaker had been forced to fall back on incision of the prostate and drainage of a small chronic abscess cavity.

Dr. **David Watson**, in introducing the subject of chronic vesiculitis, emphasised the importance of prevention of the extension of infection to the posterior urethra. He employed posterior irrigation as a routine treatment in all cases of anterior urethritis, and considered that its use diminished the risk of posterior infections. The second most important preventive measures were rest during the early stages of the disease and the avoidance of trauma to the posterior urethra. Although Mr. Kenneth Walker had pointed out that the spread of infection might occur via the lymphatics, it was practically certain that the great majority of cases of epididymitis resulted from a reversed wave of peristalsis passing down the vas. For this reason he employed atropine as a sedative and as a prophylactic to prevent extension to the other vesicle or the other epididymis. Vesiculitis, in spite of what American surgeons stated, was a rare disease, and he could not understand why American literature should lay so much emphasis on such surgical proceedings as vesiculectomy and vesiculotomy. In his opinion, these operations were very rarely required, although possibly vasotomy or the injection of the vesicles by the vas might occasionally be required.

Mr. **David Lees** (Edinburgh) stated that though in the main he agreed with what the previous speakers had said, there were certain points on which he must differ. He did not advise posterior irrigation as a routine measure in cases of anterior urethritis. In the majority of cases of early anterior urethritis treatment was carried out by the patient himself or by a more or less skilled orderly, and the risk of trauma to the urethra was too great to make posterior irrigation a safe proceeding. Of the fluids that might be used for irrigation, in addition to those more commonly employed, mercurochrome and nizin had been found to be useful. Like Dr. Watson, he used atropine as a prophylactic measure in the acute stage of the disease, giving it in doses of 1/75th of a grain in a suppository. He had also found sulfarsenol of use in the acute period, but not in the chronic. He agreed with Mr. Kenneth Walker that the action of prostatic massage was probably indirect through the contraction of the prostatic muscle. It was of interest to find Mr. Kenneth Walker in one paragraph advocating the use of a new and rather alarming rectal electrode, and in the next damning the great metallic age in the treatment of gonorrhœa. However, he agreed with him that bacteriological measures, combined with chemical, held out a greater hope of finality in treatment and in permanence of cure.

Dr. **A. E. Cambell** (Portsmouth) dwelt on the importance of early treatment in preventing the development of such serious complications as prostatitis and vesiculitis. Personally he observed the following rules when treating cases of acute gonorrhœa: (1) Never to force irrigation on an unwilling or nervous patient. (2) Never to attempt posterior irrigation during the first week or in the acute stage of the attack. (3) Never to massage the prostate or vesicles for diagnostic purposes until the urine was clear. (4) Never to pass any instrument into the bladder in a fresh uncomplicated case of gonorrhœa. He divided cases of chronic prostatitis and vesiculitis into two categories—cases in which there were no signs or symptoms beyond the existence of pus in the expressed secretions, and cases accompanied by urinary symptoms or by metastatic lesions, such as chronic rheumatism or iritis. In the former class of case vaccines produced little effect, but in the latter they were often of benefit. In addition to the methods of treatment already discussed, he had found the application of heat by a water-heated apparatus in the rectum of use.

Surgeon-Commander **R. J. G. Parnell** agreed with Mr. Lees that detoxicated vaccines were of most value in the acute early stages of the disease. Less than 5 per cent. of cases at Haslar suffered from vesiculitis, and, in his opinion, prostatitis was much more often the primary lesion in cases of metastatic gonorrhœa. Massage was the great stand-by in treatment. From sulfarsenol he had obtained no results, although he considered that the use of ichthyol internally was of value.

Dr. **James Hudson** (Newcastle-on-Tyne) spoke of the abuse of potassium permanganate in the treatment of chronic gonorrhœa. He had seen several cases in which the urethra had been damaged by too strong solutions. Sodium salicylate given by the mouth was useful as a preventive measure.

Dr. **G. L. Eastes** (London) said that vaccine therapy had received some hard knocks from previous speakers, but that a vaccine to be effective must be complete, and must comprise all the secondary organisms as well as the patient's own strain of gonococcus. In acute urethritis vaccines were, in his experience, of the very greatest use in effecting a cure without complications.

SECTION OF ANÆSTHETICS.

Thursday, July 26th.

At the opening meeting of the section, Dr. **William Joseph Essery**, the President, welcomed the presence of colleagues from other districts, and hoped that the stimulating and thoughtful papers about to be read by the distinguished anæsthetists who had written them would be followed by fruitful discussion.

Dr. **Harold Sington** (London) read a paper on

Anæsthesia for Children.

The author divided his subject into four parts: (*a*) the consideration of the preparation of the patient; (*b*) the choice of the anæsthetic to be used; (*c*) a few points on the administration of the anæsthetic of choice; and (*d*) some suggestions for making the recovery as free from discomfort as possible. Under the first head he stressed the importance of refraining from drastic purgation, and the necessity for examining the patient's urine for acetone, which was often the result of sudden change from a very rich carbohydrate to a more mixed hospital diet. Operation must be postponed until the acetone had disappeared. In all cases glucose should be given before operation, as well as a preliminary injection of atropine. In a child of 2 years and upwards as much as 1/100 gr. could be safely given. On the other hand, morphine should be avoided in the case of children. As regards the second heading, ether was the anæsthetic of choice, except when the actual cautery was to be used, and in certain special operations such as dental extractions, where ethyl chloride was preferable. Gas and oxygen was the best anæsthetic in cases of congenital hypertrophic stenosis of the pylorus and of intussusception. Under the heading of the administration of the anæsthetic the author insisted that the anæsthetic of choice should be administered gently and persuasively. A few drops of essence of orange were sprinkled on gauze, and when the child had got used to the smell, ether was slowly dropped on until unconsciousness supervened, after which it could be pushed. The airway should be kept as clear as possible. Recovery could be made much less unpleasant if (1) a drop of ol. ricini were instilled into each eye after the cessation of anæsthesia, (2) the mouth were sponged out with normal saline solution, (3) a rectal sedative were administered, such as, in the case of a child of 10 years, potassium bromide 20 gr., aspirin 10 gr., dissolved in half a pint of normal saline solution.

Dr. A. L. FLEMMING (Bristol) read a paper on

Fatalities from Anæsthetics,

in which he elected to deal with his subject entirely from the clinical standpoint. For some years past the number of fatalities due to anæsthetics had remained practically stationary, despite an enormous increase in the number and severity of the operations performed. Patients were now expected to bear a surgical burden so heavy that without improved anæsthesia the mortality would undoubtedly have been much heavier than was the case. Deaths from anæsthetics might be classified according to what time they occurred during the administration—before, during, or after, operation. In the first group were fatalities caused by the anæsthetic without the intervention of other factors, such as shock, and a large proportion of these were associated with chloroform induction. Chloroform was too dangerous a drug for routine work. The second group was difficult to analyse, but coöperation between the surgeon and the anæsthetist was necessary to avoid overtaxing the patient. When a moribund patient died during operation it was misleading to attribute the death to the anæsthetic. In the third group it was almost impossible to fix the blame. Even post-anæsthetic pneumonia might be the result of tight bandaging and not of the anæsthetic. The surgeon might then call for a change of technique which, while reducing one risk, might induce another. Again, chloroform might be the safer anæsthetic to give to a bronchitic patient, even though there were greater risk during administration. The author brought his paper to a close by discussing some of the difficulties which seem to offer most hope of solution.

Dr. H. E. G. BOYLE (London) read a paper on

Anæsthesia by the Gas-oxygen-ethanesal and the Gas-oxygen-chloroform-ethanesal Combinations,

in which he pointed out that in these methods of anæsthesia attention must be paid to preliminary medication. To children under 14 atropine gr. 1/200 was given, and to those over that age morphine gr. 1/6 and atropine gr. 1/150. For adults of ordinary physique, Burroughs and Wellcome "hyoscine compound A" was ordered, while big strong men received the same firm's "hyoscine compound B." On the whole these preliminary injections gave the best results. The contents of the ether bottle had also to be varied with the patient and with the operation. For children no chloroform was necessary, but young adults and older people did best with a mixture of ethanesal and chloroform in equal parts. For diathermy or the cautery chloroform alone should be used. Nitrous oxide and oxygen being non-toxic, the use of these drugs reduced the amount of the toxic drugs used to a minimum, which was of obvious benefit to the patient. Induction was carried out by the gas and oxygen alone, and this was followed by the introduction of the gases into the ether bottle, so that the gases picked up the vapour of the toxic drugs and passed them on to the patient. When full anæsthesia had been secured the operation was commenced. As soon as the preliminary incision had been made the anæsthetic was continued by gas and oxygen only. The anæsthetist should keep a careful watch for all changes in colour, respiration, &c., and deal with each change appropriately as it occurred, giving more or less oxygen or more or less of the contents of the ether bottle as required. The airway must, of course, be kept free if necessary by an artificial airway. The author brought his paper to a close by referring to the method in the case of throat surgery and its application in operations where endotracheal anæsthesia was necessary.

Dr. CHRISTOPHER MAYHEW (Southsea) demonstrated his apparatus for the administration of warmed ether vapour, the chief advantages for which, he claimed, were its lightness and portability, the complete apparatus weighing only 1 lb., and the whole of it being carried inside its own warming cylinder.

Reviews and Notices of Books.

SURGICAL TREATMENT OF THE TONSILS.

The Tonsils—Faucial, Lingual, and Pharyngeal. With Some Account of the Posterior and Lateral Pharyngeal Nodules. Second edition. By HARRY A. BARNES, M.D., Instructor in Laryngology, Harvard Medical School. London: Henry Kimpton. 1923. Pp. 217. 25*s.*

Tonsillectomy by Means of the Alveolar Eminence of the Mandible and a Guillotine, with a Review of the Collateral Issues. By GREENFIELD SLUDER, M.D., Director of the Department of Rhinology, Laryngology, and Otology, Washington University School of Medicine. Same publishers. 1923. Pp. 176. 25*s.*

IT must be admitted that for many years the surgical treatment of the tonsils was conducted on unscientific lines, and that their surgical anatomy and pathology were inadequately studied and taught. Surgeons were content to treat recurrent tonsillitis by slicing off the prominent part of the gland with a sharp guillotine, and it was not until some 15 years ago that they began generally to realise that this operation was often insufficient and, indeed, frequently did more harm than good by causing stenosis of the crypts and favouring the retention of septic material. To ensure a complete removal of the tonsil with its capsule various methods of dissection were introduced, and, in 1910, Whillis and Pybus, of Newcastle-on-Tyne, and Sluder, of St. Louis, U.S.A., published methods of complete removal by means of a blunt guillotine introduced in a position opposite to that in which it had previously been used, that is, with the handle now directed towards the opposite side of the mouth. The two methods are not identical, for Sluder makes use of the "alveolar eminence" of the lower jaw to dislocate the tonsil through the fenestra of the instrument, while Whillis and Pybus employ the finger for the same purpose. The question of priority is, therefore, of small importance, but Dr. Sluder explains in his book on tonsillectomy that he presented his technique before the American Medical Association on June 9th, 1910, but that publication was delayed until March 25th, 1911; in the meanwhile Whillis and Pybus published their method in THE LANCET on Sept. 17th, 1910.

Dr. Sluder's book is written primarily to describe his method of tonsillectomy, and this he does in a most clear and thorough manner. He claims "perfect results"—i.e., complete removal—in 99·6 per cent. of cases; presumably he uses his method in all cases, but we think that in the hands of the average expert complete removal with the guillotine is less certain in some cases of adult tonsils adherent after quinsy and particularly in cases of tonsils which have been previously cut by tonsillotomy. This is by far the most valuable part of the book, and it has been expanded by a chapter on anatomy and embryology, and on the indications for tonsillectomy, and by a useful chapter by Dr. Arthur W. Proetz on physiology and general pathology. There is a final chapter on removal of adenoids by direct vision, by Dr. I. D. Kelley, the inventor of the method, which, though of interest, is somewhat out of place in this work.

Dr. Barnes's book on the tonsils is on similar lines, but of a more general scope. He describes at length the development, anatomy, function, and pathology of the tonsils, and the methods of tonsillectomy at present most in use, especially dissection and snare, and the Sluder method. Dr. Barnes himself does all his operations by the dissection method for the somewhat inadequate reason that a certain number of tonsils must be removed by dissection, and that he prefers to use only one technique. There is a good chapter on the sequelæ of operation, and the methods of dealing with hæmorrhage are well described, though Coakley's slip-knot ligature is not mentioned; and there is a final article on X ray and radium treatment of tonsillar hypertrophy, of which method his personal experience is disappointing. The short chapter on neoplasms of the tonsil is inadequate. Both books are well produced and beautifully illustrated and should be valuable to the specialist.

Les Cercles Vicieux en Pathologie.

By J. B. Hurry. Translated from the third English edition, revised and enlarged by C. Flandin and F. Françon. Paris: Maloine and Sons. 1923. Pp. 354. Fr.20.

Dr. Hurry's well-known book on vicious circles in disease was first published in 1911 and the third edition was noticed not long ago in our columns. Its translation into French constitutes in reality a fourth edition, for the author has revised and amplified it for the purpose. It is right that such a suggestive piece of work should be so well received. The outstanding point on which the whole theme rests is that diseases are processes and not states—an axiom so elementary that it cannot be emphasised too often. And if the author's particular treatment of these processes lays more stress on the development of secondary disorders than on the attainment of compensations—if he seems to think of disease more as a thing which tends to go from bad to worse than as a series of which restoration and repair is one of the earliest items—it is only to indicate that nature or art may always break the circle and that art is more likely to do it if the existence of the circle is recognised.

Problems in Tuberculosis.

By Sir James Kingston Fowler, K.C.V.O., C.M.G., M.D., D.Sc. (Hon.), F.R.C.P., Consulting Physician and Emeritus Lecturer on Medicine, the Middlesex Hospital. London: Henry Frowde and Hodder and Stoughton. 1923. Pp. 64. 5*s.*

Not infrequently the value of books is inversely proportional to their size. This book is small and also valuable. But its value lies not so much in the opinions it voices—some of them will not be widely accepted—as in the expression it gives to a general feeling that all is not well with the tuberculosis campaign in this country. A correspondent, writing to the author, pointed out that leaders do not appear to lead, that many workers have become discouraged and have withdrawn from the tuberculosis service, that tuberculosis schemes have but little life in them, that sanatorium physicians and patients have become disappointed and depressed, and that the tuberculosis movement lacks soul, aims, organisation, and financial means. This picture is obviously as true as it is gloomy, and in attempting to introduce some patches of bright colour into it, the author has earned the gratitude of many. By dedicating his book to Dr. Varrier-Jones he indicates as clearly as is possible the value he attaches to the Papworth system of treatment by tuberculosis colonies and settlements. But before he comes to this topic the author gives several chapters on such subjects as the prevalence of tuberculosis, infection, and diagnosis. The chapter on the tuberculosis dispensary is short and pithy; the author is well advised in urging medical officers of tuberculosis dispensaries to be more concerned with the discovery of "contacts" than with tuberculin medication. Tuberculin is, like hilum tuberculosis, one of the author's bugaboos; he expresses the hope, which is surely unduly optimistic, that when "the tuberculin man has at last seen the error of his ways the millennium will be in sight." In the chapter on the sanatorium the pertinent question is asked: "Why, in our industrial sanatoria, can we not 'cure consumption' as Brehmer at Görbersdorf and Walther at Nordrach did in private sanatoria, and as many others have done in this country?" Here the author has put his finger on a painful spot. He answers his own question: "One of the reasons is because no attempt has been made to establish a school for the training of the men who ultimately become directors of our public sanatoria." But if such a school were established, who could be found to train the trainers? The author is fortunate in his definition of the primary object of sanatorium treatment, which is "to fit the patient for the occupation in which he was engaged before the onset of his illness." In these few words he shows his distrust of the popular belief that by putting a puny bank-clerk on to the land he will almost automatically become a hardy son of toil. Other useful hints are given with regard to the improvement of sanatorium treatment, one of which is that there should be no time-limit for the duration of treatment in any given case. The chapter on the settlement is a plea for the Papworth system, for the author believes that the solution of some of the great difficulties of the tuberculosis problem lies in "the gradual transformation of the existing sanatoria into settlements on the lines which at Papworth have been shown to be practicable." It is safe to say that no one will agree with all that the author has to say, yet everyone will find much to learn in a book which is full of caustic wit.

Perforated Ulcers.

Les ulcères perforés de l'estomac et du duodénum. By H. Mondor et G. Lauret. Paris: Masson et Cie. 1923. Pp. 186. Fr.10.

This monograph on perforated ulcers of the stomach and duodenum is a good account of the knowledge which has been accumulated to the present day on this subject. After reviewing the ætiology and pathological anatomy, the authors describe the clinical symptoms, laying great stress upon the problem of diagnosis. The most interesting section of the book to the practising surgeon is that which deals with treatment. The authors recognise three methods—namely, simple suture, suture plus gastro-jejunostomy, and resection of the stomach. Of these three methods they consider the most generally useful is the second. They are keenly alive to the drawbacks of combining any other operation with simple suture, but consider that on the whole the best results are obtained by adding a gastro-jejunostomy, especially as they recommend a wide infolding of the ulcer area. However, the relative merits of simple suture and suture with gastro-jejunostomy are well set forth, and from the statistics collected it is not possible to decide which is the safer procedure. As to resection, the authors think that it is too early to form any definite conclusion as to its advisability. They consider that in the hands of special operators it may be a method of choice.

Cancer: Fallacy, Theory, and Fact.

By John Shaw, M.D. Lond. London: George Routledge and Sons, Ltd. 1923. Pp. 184.

In this book Dr. Shaw makes "an earnest appeal to the honour of the medical profession throughout the world" to consider the treatment of cancer "without prejudice at whatever cost it may be to the immediate financial interests of the surgeon." The implication is that surgeons are tempted by greed to maintain a system of therapeutics which they do not believe in, or one, to put the position more pleasantly, whose defaults they are too ignorant to estimate. Dr. Shaw has collected a large number of figures in support of his theory that operation cannot be a rational treatment either of cancer or of precancerous growths. He is profoundly sceptical of the value of cancer research, and states that only one observation made by the Imperial Cancer Research Fund has been of practical aid to mankind—namely, that while cold does not destroy the vitality of the cells of mouse tumours moderate heat does. This observation he has utilised in the treatment of cancerous patients. Dr. Shaw's own thesis is to the effect that the secondary causes of death registered in patients succumbing to cancer are really the primary causes of the cancer, amongst them syphilis, alcoholism, gout, rheumatism, diabetes, Bright's disease, tubercle, and, above all, cardiac insufficiency and other defects of the circulatory system. The diagnosis of cancer having been made by the surgeon, he would like the patient who is averse from operation to be allowed non-operative treatment at the hands of anyone he or she may select who shall have presented prima facie proof of having cured cancer without operation or after operation had failed. Dr. Shaw suggests himself as one who has presented such proof.

PALÆOPATHOLOGY.

The Antiquity of Disease. By R. L. MOODIE. Chicago: University Press. 1923. With 37 figures. Pp. 148. $1.50.

THE author has gathered together the little that is known about the pathological anatomy of fossil animals and adds to this some account of the pathology of primitive peoples. He ranges from healed fractures and an example of osteomyelitis in Permian reptiles to the calcified aorta of King Merneptah, which showed that his heart really was hardened, even if he was not drowned in the Red Sea. For the most part his evidence is derived from the enormous mass of vertebrate material which has been found in Wyoming and elsewhere, and, relating as it does almost exclusively to bones, the picture of ancient pathology which may be derived from it is necessarily very incomplete. The rôle of parasites is specially obscure. The occurrence of bacteria in Devonian strata seems to be well-established and they have been described even in pre-Cambrian rocks. They are to be found in some fossil bones as post-mortem invaders causing sometimes a certain amount of decomposition and structural alteration. In Permian and later reptiles their activities in causing inflammatory changes have been recognised. But if they were at these remote periods the cause of epidemics we can get no evidence to that effect beyond the finding of fossil tsetse flies in the oligocene of Colorado, which suggests that trypanosomes may have played a part in the evolution and succession of the early ungulates. In the last chapter, which deals with the early historic period, the author makes no use of the evidence other than anatomical which tells us something at any rate of epidemic disease, though readers will notice with interest the reproduction of cutaneous leishmaniasis on human faces on pre-Columbian jars in Peru.

The book is badly written, with much needless repetition; its format is in the nearly perfect style of the Science Series of the University of Chicago to which it belongs.

PHYSIOLOGY OF THE NERVOUS SYSTEM.

Methodik der Physiologie des Zentralnervensystems von Wirbeltieren. By WILHELM TRENDELENBURG, Tübingen. (Lfg. 104. Handbuch der Biologischen Arbeitsmethoden. Edited by Prof. E. ABDERHALDEN. Abt. V., Teil 5B, Heft 2.) Berlin: Urban and Schwarzenberg. 1923. Pp. 93 to 372.

THIS valuable article is apparently a new edition of one which appeared some years ago in Tigerstedt's "Handbuch der Physiologischen Methodik." It is brought fully up to date. Many of the contents are extremely technical and give, in great detail, the operative technique for experimental work on all parts of the central nervous system of all classes of vertebrates. This volume, like all the other parts of this stupendous publication which we have seen up to the present, will prove of great value to physiologists working or proposing to work on the subject with which it deals. The author's own knowledge of this special branch, in which he has earned world-wide reputation, is evidently immense, and the literature quoted leads us to think that he has omitted little or nothing of importance. The paper and printing are well up to pre-war standard with the exception of some of the half-tone blocks.

JOURNALS.

BRITISH JOURNAL OF SURGERY.—This journal now enters on its eleventh year, and we are glad to point out that it has been found possible with this number to return to pre-war conditions. The type has been improved, the pages increased to 200 in number, and we are informed that no opportunity will be lost to enhance still further the value of the contents. The present issue shows clearly the care and expense spent in its production, for the numerous and excellent illustrations are of a high order. In this forty-first number Sir D'Arcy Power continues his series of Eponyms, the subject being Pott's Disease of the Spine.—L. R. Braithwaite publishes his Arris and Gale lecture on the Flow of Lymph from the Ileo-Cæcal Angle. His work is based on experimental injections into cæcal lymph glands or the cæcal wall of animals and human beings of a pigment. He shows how the lymph stream from this area flows upwards to glands near the pylorus, and suggests that this has a bearing on the ætiology of gastric and duodenal ulcers.—M. J. Stewart and S. D. Lodge report the following renal abnormalities in 6500 consecutive autopsies, 14 horse-shoe kidneys, 1 unilateral fused kidney, 16 cases of congenital absence of one kidney, and 3 pelvic kidneys.—C. A. Joll discusses metastatic tumours of bone, analysing the nature of the primary growths, the bones affected, and the method of spread. He enters very fully into that most interesting of all bone metastases, those of thyroid origin, in which the gland itself is either normal or the seat of a benign growth.—A. P. Bertwhistle reports a case of depressed fracture over the angular gyrus, and its clinical and radiological localisation.—K. W. Montsarrat describes an operation for hæmorrhoids as practised successfully by himself for three years.—Hamilton Drummond records a case of retrograde intussusception of the small intestine into the stomach after a gastro-jejunostomy, and reviews the 11 cases recorded in the literature.—G. L. Keynes's Hunterian lecture on Chronic Mastitis is reproduced in full. In it he describes the normal structure and function of the breast, and seeks an adequate explanation of the changes found in chronic mastitis. Discarding all previous theories, and pointing out that in non-lactating breasts secretion must normally be balanced by re-absorption, he suggests that irritation due to stagnating secretions and epithelial debris may be the cause of those pathological conditions grouped under the head of chronic mastitis.—H. F. Macauley reports a case of a congenital ileo-cæcal cyst causing an intussusception in a child of six months.—Prof. S. G. Shattock has some illuminating pathological remarks about sarcomata of long bones. Amongst them is a suggestion for the safe removal of pieces of bone tumours for examination by means of a heated borer, the heat preventing malignant cells being grafted in the wound.—Prof. J. E. S. Frazer writes concerning the nomenclature of certain pathological conditions in the neck caused by the remains of vestigial structures. He points out that the terms "branchial" and "branchiogenetic" are inapplicable. He outlines the development of the pharynx and the cervical sinus, and shows that any cystic or fistulous condition in the neck is capable of accurate differentiation and recognition.—A visit to the clinic of Prof. Putti at the Istituto Ortopedico Rizzoli at Bologna is described.—R. Hamilton Russell describes a simple method of operating on femoral herniæ, which does not sound in the least convincing.—E. M. Woodman discusses malignant disease of the upper jaw. He emphasises that the area from which these growths arise is much more extensive than the superior maxilla proper, and, in fact, includes the whole of the air-cell area. He advises a very wide ablation of the affected parts, with no attempt at any plastic repair until all fear of local recurrence can be excluded.—H. P. W. White analyses the factors influencing the time of closure of suprapubic urinary fistulæ following suprapubic prostatectomy.—The following rare or obscure cases are reported: (1) A. G. Timbrell Fisher, a case of Acute Hæmorrhagic Pancreatitis twice in the same patient with recovery; (2) L. R. Braithwaite, a case of Multiple Jejunal Diverticula; (3) C. Hamilton Whiteford, an Unusual Case of Death in Acute Appendicitis; (4) Douglas Drew, Perforation of Meckel's Diverticulum.

Journal of Industrial Hygiene.—July: Attention is drawn by D. C. Parmenter to the value of a health department to a mercantile business; instances are given. Each worker makes about ten visits a year to the department, and the visiting physicians see about 10 per cent. The cost works out at about $4 (18*s.*) per head. The financial benefits are not stated, except that in one case $3000 dollars were saved in one year in accident liability, about $2 a head, apart from other gains.—F. Koelsch discusses metal-fume fever and concludes that fumes of all heavy metals, such as copper, tin, lead, nickel, and mercury, as well as zinc, can cause the symptoms of brass-founder's ague. Zinc is the most usual metal concerned on account of its low boiling point, but if other metals are boiling their fumes cause similar effects.—An article of great interest to accident prevention is contributed by H. D. Kitson and C. Campbell; the authors show by striking diagrams an extremely close relation between the number of accidents and the number of new employees. They conclude that if the number of new employees could be reduced to zero the accidents would be reduced by 75 per cent. Hence efforts to reduce labour turnover and give more instruction to new workers are strongly advocated.—Danger from hydrocyanic acid gas arises in certain metallurgical and chemical operations, and in fumigating buildings, ships, and green-houses. S. H. Katz and E. S. Longfellow have developed convenient test papers for detecting the gas, which give estimations over a range of 25 to 1000 parts of the gas per million parts of air within 20 per cent. of those found by chemical analysis. Atmospheres containing 100 parts per million or over should be considered dangerous. ——August: The main article, an important one, refers to carbon monoxide asphyxia and artificial respiration; it deals with laboratory research carried out by C. K. Drinker, K. R. Drinker, L. A. Shaw, and A. C. Redfield. They found that excessive artificial respiration by positive pressure apparatus does not harm the heart; but infected mucus, &c., may be carried into air-passages and set up broncho-pneumonia. While manual methods cannot be evaluated, the Schäfer method is probably more efficacious than is usually believed. A useful bibliography is given.—Next comes the final report of the Commission on Carbon Dioxide Asphyxia, in which the Schäfer method is recommended as against any positive pressure apparatus, which may do actual harm. The use of the new carbon-dioxide-oxygen inhalations developed by Henderson and Haggard is recommended as a specific remedy whenever available.—J. Fine reports upon the phagocytosis of lead compounds and their influence upon the activity of the leucocyte. He found metallic lead less readily phagocytised than basic lead carbonate; that soluble lead injures leucocytes and diminishes their ability to engulf carbon particles; that metallic lead has a similar but less pronounced effect; and that the rate of phagocytosis of metallic lead is of the same low order of magnitude as that of quartz.

Reports and Analytical Records.

BIRMO: SWISS NATURAL BITTER WATER.

(A. G. Pluss, 9, Noel-street, W. 1.)

This water is stated to occur naturally at Birmenstorf, Canton Aargau, Switzerland. When analysed the following results were obtained, expressed as grammes per litre:—

Sodium chloride ..	2·26	Calcium carbonate	0·6
Sodium sulphate ..	11·38	Silica	0·02
Magnesium sulphate	17·2		
			31·46

The water had a specific gravity of 1029·74 (water = 1000) and was very faintly alkaline in reaction. Birmo is an aperient water which has been known for the last 80 years. It is of the Hunyadi János type (The Lancet, 1922, ii., 1284), but somewhat less concentrated. The magnesium sulphate is in excess of the sodium sulphate as the above figures show, whereas in Hunyadi János these constituents are present in equal amounts. Magnesium sulphate is one of the most powerful of the saline purgatives, its positive and negative ions both contributing to this result. It produces no irritation, as the increased peristalsis results from distension due to the presence of an increased quantity of fluid. Sodium sulphate is practically not absorbed, and it thus possesses the property of abstracting liquid from the tissues of the intestinal walls and acting as a saline cathartic. Saline cathartics, except under special conditions such as dropsy, are best given in dilute solutions as in the natural mineral waters.

IODINE MEDOL (ANTISEPTIC UNGUENTUM).

(Pearson's Antiseptic Co., Ltd., 61, Mark-lane, E.C. 3.)

This preparation is claimed to be a non-toxic and non-irritant antiseptic ointment prepared from oxygenated hydrocarbon in combination with 1 per cent. iodine and 5 per cent. hycol. By the term "oxygenated hydrocarbon" presumably is meant the mixture of liquid paraffin and oleic acid referred to in the British Pharmaceutical Codex under the name "Parogenum." Hycol is a disinfectant of the creosote or cresol type. When analysed the preparation was found to contain 0·8 per cent. of iodine which is in fair agreement with the claim of the manufacturers. Iodine medol will no doubt be found useful as a means of applying iodine in a readily penetrable form in conjunction with an antiseptic.

PHLOGETAN.

(Dick Coates and Co., 41, Great Tower-street, London, E.C. 3; J. T. Roberts, 23, Panmuir-street, Dundee.)

Reference has been made in these columns on previous occasions to phlogetan therapy, and we have now received from the British agents of the Czecho-Slovakian laboratories samples of the latest method of preparation and evidence of the increasing interest taken by the medical profession in the drug. Phlogetan is a derivative of albuminoid bodies containing nucleo-protein, and is issued in hermetically sealed ampoules for intramuscular or subcutaneous injection. It was first brought to the attention of the medical public by Prof. Oskar Fischer, of Prague, who reported favourable results in tabes, since when the range of utility has been extended by other observers. There seems no doubt that good results have been obtained in association with the usual treatments for the condition, but the directions for administration, which are sent with the preparation, should be carefully followed.

VITANIUM.

(Vitanium Company, Link Hall, Sandhurst, Kent. Agents: May, Roberts, and Co., Ltd., and Edwards and Son.)

We have received a sample of "Vitanium," a liquid stated to possess the property of converting caseinogen into a non-coagulable protein, thus making cow's milk more digestible to infants. The preparation consists of sodium saccharate with a trace of sodium albuminate, the action on caseinogen being one of hydrolysis. It has been specially recommended for adults who have found cow's milk indigestible or constipating, while they could readily digest milk which does not curdle. To prepare milk for the infant the instruction is, "Take half a pint of milk in the morning, add one teaspoonful of sugar, half a teaspoonful of Vitanium, and boil." In the case of Grade A milk boiling is not considered necessary. For adults one teaspoonful of Vitanium is added to each pint of milk and well stirred in. The preparation can be used for any age and for any length of time without harm.

THE LANCET.

LONDON: SATURDAY, SEPTEMBER 15, 1923.

HEADACHE.

AMONG minor nervous afflictions to which the flesh is heir headache enjoys an unenviable prominence. It belongs to a group of ailments the annoyance occasioned by which is not diminished because they may interfere but slightly with the working capacity of the individual. If some bouts do, in fact, lead to prostration, others receive no more notice than a casual comment that the sufferer is having "one of her headaches." Her headaches! There is scant sympathy in the possessive, as though headache were a thorn in the flesh planted by an inscrutable Providence, to be endured rather than cured. We may call it a minor affliction if we will, scarcely enough, sometimes, to arrest attention, still less compel investigation, but the dictum of BRISSAUD is in this respect peculiarly applicable: "rien ne serait moins scientifique que d'établir entre les problèmes médicaux une hiérarchie basée sur la gravité des symptômes; pronostic à part, il n'y a ni grandes ni petites maladies."

For all its banality, headache is a symptom the causation of which is frequently as obscure as its exact localisation is elusive. Last week in our own columns Mr. A. B. PAVEY-SMITH, of the Royal Bath Hospital, Harrogate, dissatisfied with what he has found in most books of reference, came forward with a classification of the "starting-point of the pain" into three main groups—viz., intracranial, cranial, and extracranial. This division, it should be understood, is not concerned with the diseases of which headache may be a symptom, but with the actual sites of the pain-causing lesion. How are these sites to be determined? The observer has at his disposal two criteria, the subjective and the objective—what the patient feels, and what the pathologist finds. He can, further, utilise the information furnished by the histologist as to the tissues in which sensory nerve-endings can be demonstrated, and by the physiologist as to the appropriate stimuli for the awakening of afferent impulses to the sensorium. Unfortunately it must frequently happen that he has to rely on the subjective data only, the pathological condition being uncertain and its localisation indeterminate. Further, it is clear, as indeed Mr. PAVEY-SMITH admits, that an intracranial change, giving rise to an "intracranial headache," may be brought about by extracranial lesions; disease may affect simultaneously more than one site wherein pain may originate; and in not a few instances the correlation of the pathological condition with the specific tissues in which is situated the presumed "lesion" causing the pain must be a matter of considerable difficulty. Mr. PAVEY-SMITH'S proposed classification is symptomatologically topographical but not ætiological, and in spite of its ingenuity not a little is purely speculative—a comment that might be passed on every classification since the era of Galen. The father of medicine, it may be recalled, believed the seat of the pain in headache might be (1) in the arteries and veins of the brain or in the meninges, (2) in the pericranium, and (3) in the temporal muscle—e.g., in hemicrania. He distinguished between internal and external headache, between pain situated in intracranial, and that in extracranial structures, and, according to Dr. HARRY CAMPBELL, even claimed to diagnose one from the other. How much of his contention was a lucky guess and how much based on objective considerations it would be difficult for us now to determine.

We know, of course, that the pain of headache exists only in consciousness, and while we shall not attempt to "localise" the latter we may, for the sake of argument, assume that the appreciation of painful stimuli depends on the integrity of the sensory cortex. Whether, as a fact, it is at the thalamic or the cortical level that impulses of the physiological order are transformed into painful sensations of the psychical order is immaterial for the moment. Wherever the change, we do not suppose the sensation is there "localised" by the psychologist. Painful sensations are, however, "referred" by consciousness to such and such parts of the head; they appear with some sort of localising sign. This can rarely if ever be so definite as to enable the patient subjectively to refer the sensation to an intracranial, cranial, or extracranial seat; a purely topical localisation (frontal, vertical, occipital, &c.) may be accepted by the observer, but we should be somewhat sceptical of the nicety of introspection which would distinguish, for an instance, between bone and meninges, or between scalp and bone. We even are more tolerant of the symptomatological hyperboles of the neurasthenic, who declares he feels "as if his brains were being stirred about by a red-hot poker," than we are of any attempt on subjective grounds to differentiate dura from scalp as an algogenic centre. There are certain generalisations, derived from the statements of many headache victims who have been able to regard their infirmity in a detached way, beyond which it seems unwise to pass. Thus in migraine the headache appears to be largely extracranial, though Mr. PAVEY-SMITH, on the other hand, places the "starting-point" of the pain in the sensory cortex; similarly, in the variety known as nodular or indurative headache the individual concerned can usually locate the seat of the pain in extracranial structures. In cases in which the cephalalgia is accompanied by tenderness of the scalp an extracranial origin will be assumed, incorrect though this may be from the physiological viewpoint. In short, so little reliance can be placed on the subjective criterion that neither symptomatologically nor ætiologically can it furnish useful information.

The difficulty facing the clinician who depends solely on the findings of the pathologist is no less real. Headache associated with cerebral tumour, as an example, exhibits no constant relation to the site, size, or nature of the neoplasm. Has the headache of cerebral syphilis a meningeal, vascular, or parenchymatous "starting-point"? It is doubtless "intracranial," but more precision is desirable, if it can be attained. There is evidence apparently supporting the view of the insensibility of the cerebral cortex itself, but we are not sure that the stimuli hitherto applied are those to which it is physiologically capable of responding. Visceral pain, it would appear, is caused by the stretching of hollow viscera, but not by bruising or cutting. The dura probably reacts to stretching or distension; does its inflammation, per se, originate pain, or must the former or some other factor also come into play? Such questions will not be readily answered until a larger number of experimental data, preferably derived from observations on man, have accumulated. From quite another standpoint all cranial pain must originate in stimulation of the end-organs of the trigeminal nerve, or of the upper two cervical dorsal roots, or, conceivably, of sympathetic afferents reaching sentient centres otherwise, and further localisation might seem otiose. Yet the "central pains" of thalamic lesions must not be forgotten, nor the topoalgia of hysteria and the "psychalgia" of other patients vaguely classed as "functional." The twin problems of the ætiology and localisation of headache call for much more examination, it will be seen, and Mr. Pavey-Smith's contribution is a welcome addition to a difficult subject.

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LABORATORY DIAGNOSIS OF SYPHILIS.

Many workers in the field of pathology have endeavoured to simplify the original Wassermann technique with its five variable constituents. Some of these attempts have resulted in useful modifications, but on the whole the short cuts introduced for this purpose have resulted rather in a loss of accuracy than in any real saving of labour, or an increased simplicity in the performance of the test. As a consequence the unreliable results which not infrequently come from the hands of those who are attracted by the ease of such modifications as consist in relying upon the natural amboceptor or complement in the patients' serum have brought a certain amount of criticism upon this really trustworthy aid to clinical diagnosis. The precipitation test, first put upon a practical basis by Sachs and Georgi, and which has been previously referred to in our columns,[1] differs essentially from these less reputable modifications of the Wassermann method in placing the reading of the test at an earlier stage, when a visible precipitate has been formed by the interaction of antigen and the patient's serum in positive cases—a precipitate which it is widely held exists in a less obvious form, and is detected by a biochemical method, in the Wassermann technique. A modification of this test was described in The Lancet in 1921 by G. Dreyer and H. K. Ward, and designated by them the Sigma Reaction[2]; this test has since been utilised by a number of workers with very satisfactory results. Recently a comparison of the results given by Prof. Dreyer's method with those obtained by the Wassermann test has been instituted by the Medical Research Council, who have embodied their findings in Special Report No. 78. In this publication are given the results of three independent sets of investigations: a special inquiry, undertaken on behalf of the Council by Prof. Dreyer and Dr. Ward in collaboration with Prof. J. McIntosh and Dr. P. Fildes, and two further independent researches, on larger series of cases, carried out by Prof. Adrian Stokes and Dr. Wigham in Dublin, and by Drs. Thomas Houston, Boyd Campbell, Smyth, Rankin, and Hall in Belfast. The results of these two latter inquiries have been previously made public and are reproduced in the present report. These three sets of investigations are thus complementary, although distinct from one another. If, however, we summarise their combined statistics we find that in all 3651 sera have been examined, and that in 3430 of these the results of the two tests are in agreement. There is therefore left a set of 321 cases, about 9 per cent. of the total, in which the results of the two tests differ. It should be noted in this connexion that in the Dublin figures, which constitute the largest series of the three and include 1515 cases, the percentage divergence is as low as four.

The general agreement of the two tests is therefore abundantly evident and needs no emphasising, but it is very necessary to examine as critically as possible the reasons for such divergences as exist and to estimate, as far as we can, which test speaks with the greater truth. The details of individual discrepancies can only be learned by laborious wading through some 100 pages of tabulated cases, but the clinician may take comfort from the fact that it is mainly in the borderline cases—early primaries, or treated syphilis, where the serum reactions are appearing or fading—that such discrepancies arise, and in these conditions difficulties in diagnosis are not usual. Prof. Dreyer expresses his results in arbitrary units of his own invention, and considers anything over 1·5 units to indicate a positive result. The sigma test, like all serum tests for syphilis, is a quantitative one, a reaction of some degree being probably obtainable with most sera, but only appearing in a sufficient intensity to be readily perceptible by current methods in the case of serum from syphilitics, and it may well be that the figure of 1·5 is too low. If this be so many of the noted discrepancies will disappear and the agreement of the tests will be yet more striking. On the other important question as to which test is most likely to give accurate information in the few cases of undoubted active syphilis where discrepancies arise we have not sufficient information to dogmatise, but it is evident that sometimes the one and sometimes the other may give a true result—a finding which is occasionally seen where different Wassermann techniques are employed simultaneously to test the same serum. The decision as to which test to adopt is almost a personal one for individual pathologists. The flocculation test has the great advantage that it dispenses with three of the variable and unstable factors in the Wassermann reaction—hæmolysin, complement, and red cells—but as used by Prof. Dreyer and his colleagues it is undoubtedly laborious and the use of drops as units of measurement is not likely to appeal to the majority of laboratory workers; it is, however, likely to be of especial use to the man who has a few tests to carry out or who does them at long intervals The Wassermann reaction at the present time is more rapid in performance and more easy to read—considerations which are of great importance in institutes where many tests are carried out each day. We think, however, that the precipitation test is capable of further simplification, and that in the not distant future it will probably replace the more complicated Wassermann. The whole gist of the results of many investigators upon the comparative values of these tests, which have been prosecuted now for three or four years, is that in the hands of a competent operator both are equally reliable as diagnostic aids to the practising physician.

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WHAT THE PUBLIC HEALTH SERVICE DOES FOR THE PUBLIC.

The importance of education of the public as a means of improving the health of its constituent members is becoming more fully realised, and the advance in efforts to this end has been especially marked in recent years. The democratisation of government, both central and peripheral, and the fundamental fact that government now means control by elected persons who are non-experts, but who have or can have experts to advise them, necessitate enlightenment and persuasion of the general public if advance and reform are to be secured. Compulsion can only succeed in compelling—except possibly for a short period and in exceptional circumstances—provided it has behind it the preponderant opinion of the public who may be liable to compulsion. Even then, as the experience of recent years has shown, a persistent though small minority may make a particular department of control impracticable; and we are obliged, therefore, to add the possibility of converting the minority into accord with the majority as an essential element of the application of compulsory measures. When this is secured compulsion merely means the organised expression of the will of the community. These considerations emphasise the importance of efforts for the enlightenment of the public in regard to public health work. In this respect our American friends have given us much valuable leading, and although occasionally measures of publicity in some areas have been extravagant enough to call forth caustic strictures from Dr. CHAS. V. CHAPIN, one of the greatest of American sanitarians, on the whole it can be said that great skill has been shown in convincing the public of the need of new departures and in persuading them to adopt them. This has been strikingly evident in recent successful efforts in several large cities to immunise a large proportion of the children against diphtheria. Of all measures for education of the public none is equal in permanent value to instruction of school-children, carried out on rational lines, and from that point of view we welcome the opportunity to quote in another column extracts from a recent series of draft articles sent to editors of public journals in the United States by the Acting Surgeon-General of the Federal Public Health Service, and intended to be read by scholars in upper grade and high schools. Similar efforts have been made on a small scale in this country, but none, so far as we are aware, are so systematic and complete as the one under review, and it is for this reason that we draw attention to the present example of wholesome propaganda.

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[1] Münch. med. Wochens., 1919, lxvi., 440; and The Lancet, 1921, ii., 799, 1322 (inter alia).

[2] The Lancet, 1921, i., 956.

HOSPITAL CONTRIBUTORY SCHEMES.

THE result of a questionnaire issued by the Voluntary Hospitals Commission as to the methods adopted in various areas to obtain contributions is, on the whole, disappointing. Particulars were received of 72 contributory schemes, affecting 102 hospitals, and a digest of the information available is now issued in a statement [1] for the benefit of local committees and the hospitals in their areas. It is disappointing mainly because the variety of local conditions, reflected in the variety of methods that have been adopted for working contributory schemes, is so great and the schemes in most cases of such recent origin and incomplete development that few lessons of general application are yet available.

Certain obvious points most schemes have in common—for example, reliance for contributions mainly upon deductions from wages. This can, of course, only be effected with the full consent of the wage-earners themselves and with the active coöperation of the employers or, in a few cases, of a voluntary collector at the works. In some instances the employers add a contribution of their own. The method of collection in a rural area presents considerable difficulty, special arrangements having to be made to reach the farmers. Applications and contributions forwarded through the post are not likely to lead to such good results as a scheme worked through group and village committees, the contributions being collected by a volunteer in every village. The collection of regular contributions from the "self employer" presents a special difficulty. They can be reached by a personal canvass in house-to-house collections, or by leaving a collecting book or box which is called for periodically. As to the amount of contributions, the sum payable each week varies from 1*d.* to 3*d.* a week on a fixed basis, or on some graded scale as 1*d.* in the £ of wages. In the simplest forms of contributory schemes the whole of the contributions are paid to the hospital and are allocated to meet maintenance expenditure. In a number of schemes, however, the hospital does not take the whole of the amount subscribed, but some allocation is made to other services—a percentage going, for example, to convalescent homes, nursing associations, and, in one instance, to dental services.

The inducement to be held out in order to attract contributors is a difficult feature in framing a contributory scheme. The majority of hospitals have been careful to avoid holding out any inducement that would bind them in a contractual obligation. There are very few instances in which anything approaching an insurance scheme has been attempted, but in one or two such cases the hospital authorities have guaranteed to all their contributors certain definite benefits. In one scheme the promoters have guaranteed free maintenance in any general hospital and in any convalescent home when required. In other cases the promoters have guaranteed immediate admission and free treatment for their contributors. In others the league or the association which works the contributory scheme guarantees to pay to the hospital a fixed sum per week in respect of each contributor treated. A certain number of schemes, without pledging themselves to the admission and free maintenance of contributors, provide as an inducement certain special benefits which are not available to non-contributors; these include convalescent treatment for the contributors and in some instances for their families, the benefit of specialist services for eye and ear cases and gynæcological cases, special orthopædic treatment, facilities for obtaining surgical appliances and spectacles at reduced fees, and assistance for dental treatment. A common form of inducement is the simple practice whereby contributors or their dependents when admitted are not asked, as are other patients, by the almoners to make a donation to the hospital. The majority of the hospitals, however, promise no special privileges, but rely upon the charitable instinct of the public, maintaining the principle that the necessitous poor and the medically urgent cases must have the first call upon the resources of the hospital. Subject to that, the contributors in practice get facilities for admission and in many instances are not asked to make any further donation to the hospital. It is noteworthy that of all the schemes examined only four have indicated that payments by patients have diminished as a result of the operation of such a scheme. Few schemes do not make some provision for representation of the workpeople contributing on the governing body of hospitals, but the nature of such provision varies from representation on the board of governors only to eligibility for election to the committee of management and the house committee. For reasons which we indicated in commenting on the Sheffield scheme last week this question may ultimately be of extreme importance. The promoters of contributory schemes were invited to state in their replies to the questionnaire any special features which they considered to have contributed to the success of their scheme; the replies have not revealed any one dominant factor as ensuring success. This is not surprising, since the personality of those stimulating the work in any area is probably the weightiest factor and there are no scales whereby this may be compared.

Careful study of the report leaves the impression that the present schemes are transient in conception and execution, and that those who rely least on the detached charitable instincts of the public (which can still manifest itself on the old lines) and most on the sense of responsibility and local pride which it is possible to awaken in those who not only support but help to run their own hospitals, will ultimately prevail.

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[1] V. H. Cmn. 10. H.M. Stationery Office. 3*d.*

Annotations.

"Ne quid nimis."

THE LONDON MEDICAL SCHOOLS.

We have received note of formal opening ceremonies at four of the medical schools. The winter session at the Middlesex Hospital will open on Oct. 2nd at 3 P.M. at the Scala Theatre, Charlotte-street, W. 1, when Mr. Somerville Hastings will give an address on Team Work in Nature, and Princess Alice, Countess of Athlone, will distribute the prizes. The annual dinner will be held the same evening at 7.30 P.M. at the Trocadero Restaurant, Sir John Bland-Sutton presiding. St. George's Hospital Medical School will be opened on Monday, Oct. 1st, at 3 P.M., when Mr. E. B. Turner will deliver the inaugural address at the Medical School. King's College Hospital Medical School will have a formal opening on Wednesday, Oct. 3rd, at 2.30 P.M., when Mr. H. J. Waring, Vice-Chancellor of the University of London, will deliver the address, Lord Hambleden presiding. The annual dinner will be held the same evening, 7 for 7.30 P.M., at the Connaught Rooms, Great Queen-street, with Dr. Arthur Whitfield in the chair. Sir Humphry Rolleston will deliver the inaugural address at the opening of the London School of Medicine for Women on Oct. 1st at 3.30 P.M. We are informed that St. Bartholomew's, Guy's, St. Mary's, St. Thomas's, and University College Medical Schools are having no formal opening this year. St. Thomas's old students' dinner will take place on Oct. 26th, 7 for 7.30 P.M. at Princes' Restaurant, Piccadilly, Mr. W. H. Battle presiding. The annual dinner of past and present students of St. Mary's Hospital Medical School will be held at the Connaught Rooms on Oct. 1st, at 7 P.M., Mr. V. Warren Low presiding.

THE ORIGIN AND PREVENTION OF ANTHRAX.

Anthrax in its causation and prevention is essentially an occupational problem, at least in industrial countries. Study of its prevalence in Germany[1] during the past decade indicates how it originates and at the same time the lines which must be pursued to eradicate it.

Notified Cases of Anthrax.

Year.	Animals.	Human beings.
1912	6283	274
1913	6816	224
1918	1002	29
1919	743	18

Clearly the chief source of infection both for animals and man is raw material imported from abroad, the supply of which was largely cut off during the war. From 1910 to 1921, out of 1458 cases about one-half (746) occurred among those employed in agriculture, a higher proportion than occurs in this country. When the remaining cases are distributed among the three main industries concerned a great difference is found between Germany and Great Britain; the difference is due no doubt to the comparatively small woollen industry in Germany.

	Number of cases, 1910–21.	
Industry.	Germany.	Great Britain.
Hides and skins	538	198
Hair and bristles	113	60
Wool	4	443

Great Britain has already led the way in establishing a Government disinfecting station at Liverpool for dealing with infected wool. Germany has now to come to grips with her particular problem, the disinfection of imported hides and skins. Among tanyard workers the source of infection was traced in 335 cases, of which only 19 were due to home hides. Anthrax in home animals arises chiefly from infection carried on to pasture land by waste water from tanyards, so that disinfection of imported material would presumably eradicate the disease.

Three disinfecting processes are known[2]: (1) the Seymour-Jones process, in which the hides are treated with a solution of 0·02 per cent. chloride of mercury and 0·9 per cent. formic acid; (2) the pickling process, in which a solution of 1 to 2 per cent. hydrochloric acid and 10 per cent. sodium chloride is used at a temperature of 20° to 40° C.; and (3) the lye process, the basis of which is a 0·5 per cent. soda lye with 1 to 10 per cent. sodium chloride. The two last are considered better than the first; but each has its special advantages. Pickling takes place before liming and treated hides can be salted and kept. The lye process may be combined with liming or softening, but hides treated are unsuitable for keeping; hence while valuable at tanyards, it is not suited for separate disinfecting stations. The next important decision to be arrived at is whether disinfection, which has been proved to be practicable, should take place in stations at the principal ports of import or in the tanyards themselves. Dr. H. Leymann rather favours disinfection at the tanyard. Certainly all suspected wool on import can be more easily passed through our disinfection station at Liverpool than could hides and skins coming into Germany by a number of channels be directed through a few stations; expense and hindrance to commerce would be entailed, but more certain disinfection would be ensured.

LILLIPUTIAN TUBERCULIN DOSAGE.

In *Paris Médical* for August 18th there is a paper by Prof. J. J. Viton, of Buenos Aires, who describes what he calls a novel method for diagnosing and treating tuberculosis with tuberculin. He has tested his theories for nine years and still writes of them with enthusiasm. As he points out, Koch attempted to diagnose tuberculosis by injecting a large enough dose of tuberculin to provoke a febrile reaction and other signs and symptoms indicative of a temporary exacerbation of the disease. Prof. Viton injects an infinitesimal quantity of tuberculin—he frankly calls it a fantastically small quantity—and instead of getting a temporary exacerbation or aggravation of the disease he achieves marked improvement in all, or almost all, the symptoms from which the patient was suffering. He takes Koch's undiluted tuberculin or a preparation resembling the tuberculin of Denys, and dilutes with a 0·25 per cent. aqueous solution of carbolic acid till he arrives at a dilution of 1 in 1,000,000. This is his starting-point or strongest dilution which he calls A. By repeating the dilutions he ultimately gets to a dilution of 1 in 1,000,000,000,000,000,000,000,000,000 and even higher dilutions, and he calls these dilutions B. C. D. . . . exhausting all the letters of the alphabet. When, in a case of pulmonary tuberculosis with tubercle bacilli in the sputum and signs of progress of the disease, with or without fever, an R. S. T. or higher dilution of tuberculin is injected, the fever, cough, and expectoration diminish, the patient sleeps and eats better, and his general condition is improved. This response occurs 10 to 15 hours after the injection of 0·25 c.cm. of the highly diluted tuberculin, and the beneficial response is of diagnostic as well as therapeutic value. Prof. Viton classifies his patients according as they are (1) tolerant, (2) sensitive, (3) very sensitive, or (4) hypersensitive. In the first class, suitable for dilutions A to F, are chronic or subacute cases of rheumatism of Poncet's type, neuralgia, neuritis, dyspepsia, and the like. In the second class, suitable for dilutions G to L, are early apyrexial forms of tuberculosis, including tuberculosis of the skin and cases of obscure dyspepsia. In the third class, suitable for dilutions M to R, are cases of early subfebrile tuberculosis, anæmia of obscure origin, and neuro-muscular asthenia. In the fourth class, suitable for dilutions S to Z, are febrile cases of pulmonary and other forms of tuberculosis. If an unfavourable effect is obtained with a certain dilution, it is evidently too strong and a higher dilution must be tried. The good effects obtained with a high dilution last for a variable period, from 1 to 30 days or more. When the good effects begin to wear off an injection of a slightly stronger dilution is given, and the improvement which follows lasts as long as, and often longer than, that observed after the first injection. Prof. Viton does not say whether he has or has not carried out control tests with a 0·25 per cent. solution of carbolic acid alone.

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[1] A Survey of Occupational Anthrax in Germany, International Labour Review, vol. viii., No. 2, August, 1923, pp. 269–278.

[2] Anthrax in the Tannery Industry. H. Leymann, International Labour Office, Geneva. Studies and Reports, Series F., No. 7, August, 1923. 1s.

THE LONDON CRIPPLES' FRIEND.

Sir William Treloar did not long survive his eightieth birthday when occasion was taken to celebrate the work on behalf of London crippled children to which he devoted his life. His last public appearance was at the Mansion House on Feb. 21st, when Lord Balfour handed him a substantial cheque for the Alton hospitals. We recalled on this occasion the fact that Treloar accepted the mayoralty in 1906–7 solely in his desire to help the children of the metropolis. Realising, as few laymen have realised, that a large proportion—Treloar himself put it at nine-tenths— of the crippledom of this country is caused by tuberculosis engendered by bad air, bad food, and slum surroundings, he vowed to establish a hospital for children crippled by tuberculosis and to collect for this purpose £60,000 during his mayoral year. The hospitals at Alton Park and Hayling Island which bear his name have put some thousands of children in the way of complete economic recovery, and have done more in setting a standard for similar treatment elsewhere. Of late years Treloar had lived principally at one or other of these hospitals in quiet enjoyment of the realisation of his youthful dreams. He will need no other monument.

EFFECTS OF A RESTRICTED DIET ON RATS.

Some of the effects of a restricted diet have been studied by James Rollin Slonaker and Thomas A. Card.[1] Their studies have been continued over a period of eight years on rats, some of which were fed on a so-called vegetable diet, and others on a similar diet with the addition of a certain amount of animal protein—called an omnivorous diet. The effect on growth is of interest. The maximal weight of the males fed on the restricted diet was 35 per cent. less, and that of the females 25–28 per cent. less, than that of the corresponding control animals. The maximum weight was reached considerably earlier on the omnivorous diet. The duration of life was shorter on the restricted diet, but was prolonged when food containing animal protein was added to the diet. Moreover, the offspring of the rats fed on the restricted diet were less in weight than those of the controls—the newborn males being 18 per cent. and the females 14·5 per cent. less. The effects of the restricted diet became more and more pronounced until they reached the age of 250 days. The males were then 60 g., the females 25 g. behind the controls. The effects on pubescence and menopause were striking. In young rats the onset of sexual maturity was considerably delayed on a purely vegetable diet, as compared with normally nourished omnivorous animals, and this delay was the more evident the earlier the animals were fed on the vegetable diet, and the effect was more marked in the males than in the females. The period of menopause was not much delayed, but the period of sexual activity was shorter in those animals fed on the one kind of food. Moreover, on the restricted diet a considerable number of the animals remained sterile, and this was the case more frequently in the females than in the males. The longer the feeding on the one kind of food is continued the more marked were its effects. If to the vegetable diet animal food was added, the animals, as regards onset of sexual maturity, menopause, and duration of sexual activity, approach nearer these conditions in the normal animal, and the number of sterile animals was less. The effect on the number of litters and young born was also striking. On the purely vegetable diet a considerable number of the animals were impotent; their capacity for reproduction was less and disappeared in the third generation. Animals which were still capable of reproduction recovered on an omnivorous diet and manifested again almost normal relations. Of 70 pairs fed on omnivorous diet the number of litters was 3·28 per pair, the total number of young 15·7 per pair, and the number at each litter 4·77. The corresponding number in 69 pairs confined to a vegetable diet were 1·58, 7·8, and 4·68. The corresponding results on a number of pairs, where one parent was fed omnivorously and the other on a vegetable diet were 2·0, 8·82, and 4·41. If the parents and young alike were kept on vegetable diet the numbers were 1·82, 6·64, and 3·65, and in corresponding animals fed on the omnivorous diet the numbers were 2·64, 10·36, and 3·93. These effects on growth and sexual maturity of a reduction of animal protein in food are certainly noteworthy.

INFANT MORTALITY FROM TUBERCULOSIS.

The Registrar-General's annual review for 1921—a preliminary summary of which appears on p. 582—includes an important study of the course of the national death-rate from tuberculosis, to which special attention may be drawn. The study teems with difficulty, as there are known to have been changes in custom in certification and an important change in the classification of "hydrocephalus" which when not described as "acute," has since 1901 been excluded from tuberculosis. It appears, however, that if all changes in classification were eliminated the death-rate from tubercle of the nervous system (practically all tuberculous meningitis) in 1921 would be increased only from 0·70 to 0·92 per 1000 births, as compared with 3·03 in 1876–80. Tabes mesenterica, now rarely returned as a cause of death, up to 1901 was the commonest form of record for deaths from abdominal tubercle; and it is highly probable that a large share of the reduction in the death-rate from tubercle of the intestines and peritoneum—from 4·51 in 1876–80 to 0·45 in 1921—is due to the fact that in past years non-tuberculous conditions were often returned as tubercle. Tubercle of other sites has declined as a cause of death in the same period from 2·06 to 0·39 and of all sites in the aggregate from 9·29 to 1·54 per 1000 births. Valuable diagrams given in the report enable the course of events for quinquennial periods from 1861–65 to 1916–20 to be traced, and it is important to note the totally different courses followed by the mortalities from pulmonary and from non-pulmonary tuberculosis. The decreased death-rate from pulmonary tuberculosis has gone on for a long series of years, and since 1866 has occurred at a remarkably constant rate; whereas, the total rate from non-pulmonary tuberculosis is changed but little until after 1891 when a very rapid decline began. It appears highly probable that the explanation lies, as is suggested in this review, partially in the fact that with the greater sense of responsibility following on Koch's publication of the discovery of the tubercle bacillus in 1882, there was no balance of over-statement to be eliminated in the case of phthisis, whereas there was a large balance of overstatement in the case of non-pulmonary tuberculosis, both infantile and at all ages.

There would appear, however, to be a real decrease in infantile tuberculosis. For, as is pointed out in the review, infant mortality in general has declined enormously, and tubercle might be expected to have shared in this decline. There has also been increased protection of infants from exposure to infection by sputum, in connexion with institutional treatment of open cases of phthisis and otherwise. Furthermore, so far as tuberculous meningitis is concerned, if deaths formerly attributed erroneously to this disease are no longer so attributed, we might expect increased mortality from "meningitis," but there has, on the contrary, been decreased registration of deaths under this heading. The general conclusion must be that the decline shown in the statistics has both fictitious and real constituents. The subject is one of great importance, as bearing on the estimation of success of anti-tuberculosis work. Events since the beginning of the present century are especially instructive; and there is reasonable ground for believing that infection of infants and young children with tubercle bacilli in massive dosage or of frequent occurrence is diminishing with the development of hygienic precautions and the general education of the public in connexion with the administrative control of tuberculosis.

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[1] Amer. Jour. of Physiology, vol. lxiii., No. 3, and vol. lxiv., No. 1, 1923.

THE DEVELOPMENT OF FILARIA RECONDITA.

BULLETIN No. 144[1] of the Agricultural Research Institute at Pusa contains observations on the morphology and life-cycle of *Filaria recondita* Grassi, by M. Anant Narayau Rao, assistant professor of agriculture in the Madras Veterinary College. The material on which these observations are based was obtained from the in-patients in the dog ward of the College Hospital. The microfilariæ or embryos are sheathless, 221–225 μ in length, with a breadth of 4½–5μ, and in common with microfilariæ of other species they shoot out from the cephalic extremity a minute spine. An interesting point which the author ascertained, a character possessed in common with the embryos of *Filaria bancrofti*, is the habit of nocturnal periodicity. The embryos increased in number in the blood after 7 P.M., were swarming at midnight. Exposure to the sun or exercise reduces the few microfilariæ which can usually be found in the peripheral circulation during the daytime. At autopsy the largest numbers of microfilariæ are found in the lungs. Dogs that have died of this infection show characteristic pathological appearances—all the internal organs were anæmic, while the liver exhibited caseating areas surrounded by a zone of congestion; similar, but less intense, lesions were present in the spleen. The real interest of the paper lies in the fact that the author has traced the full development of this microfilaria in the thoracic muscles of *Culex fatigans*, while he has definitely shown that *Stegomyia* cannot serve as an intermediary host. The development follows that of *F. bancrofti* very closely and the mature larvæ can be demonstrated in the proboscis on the fifteenth day. They measured about 0·5 mm. in length. This work finally disposes of the suggestion of Grassi and Calandruccio that development may take place in various species of flea and tick.

SPONDYLOLISTHESIS.

THE skill, frequency, and financial success with which osteopaths are wont to reduce an imaginary dislocation of the spine are apt to blind us to the fact that there really is such a condition. Since Rokitansky in 1836 published an account of two cases of spondylolisthesis many such cases have been recorded, and by 1890 Neugebauer was able to collect as many as 101 cases from the literature. It is significant and humiliating to the medical profession that the correct diagnosis was made during life only in 47 of these cases; in the remainder the correct diagnosis was deferred to the post-mortem examination. Records such as these may tempt the osteopaths and other Philistines to scoff at this exhibition of orthodoxy, but it would be fair to point out that these mistakes belonged to the pre-Rontgen period, and it is comforting to note that all the 15 cases collected by Neugebauer some years later were diagnosed correctly during life. In *Norsk Magazin for Lægevidenskaben* for July Dr. Sofus Wideröe, one of the surgeons attached to the Communal Hospital of Christiania, has recorded two instructive cases of forward and downward displacement of the fifth lumbar vertebra in relation to the sacrum. In both cases complete recovery was effected by immobilisation of the affected parts by Hibb's bone-grafting operation which established bony union between the lowest lumbar vertebra and the sacrum. The first case was of special interest, as it clearly showed the mechanism of this dislocation and the diagnostic pitfalls it may dig. The patient was a girl aged 18, who, two years earlier, was indulging in horse-play with a strong boy standing behind her and arching her body forcibly backwards. She felt a sudden painful snap in the back and had to stop playing, but she was able to walk home. The next two years were passed in pain and invalidism; when she attempted to walk she was subject to attacks of violent pain in the back, making her collapse on the ground. Pott's disease was suspected, but a skiagram showed no sign of it. Treatment for two months by extension rid her temporarily of her pain, but after she had been symptom-free for about 11 months an attempt to return to office work provoked a relapse, and she went from one physician to another, being treated for rheumatism and other hypothetical complaints, and becoming steadily worse. On admission to Dr. Wideröe's hospital she showed definite lordosis of the lower lumbar spine, which became painful when she attempted to stand as straight as a recruit. A skiagram taken in the frontal plane revealed nothing of interest, but a skiagram taken from one side showed the fifth lumbar vertebra to be displaced forwards, the third lumbar vertebra forming an angle of 80° with the sacrum. The complete recovery effected by Hibb's operation in this and Dr. Wideröe's second case is well worth the notice of surgeons in charge of traumatic spinal cases with obscure symptoms and without the benefits of a skilled X ray examination.

THE RISKS OF THE MECCA PILGRIMAGE.

INTERESTING particulars are given in a recent report[1] of the measures taken to prevent the spread of cholera in Egypt. Before the war the pilgrims leaving Egypt averaged about 13,000 per annum; during the war the number was greatly reduced and now the size of the pilgrimage is gradually increasing. The numbers for the last five years have been: 1916, 1076; 1917, 281; 1918, 464; 1919, 444; 1920, 1657; and 1921, 2956. All the pilgrims were vaccinated against cholera before leaving Suez. The medical officer in charge reported that there were no facilities for hospitalisation of the pilgrims in the Hedjaz, in Jedda and Mecca and that his supply of drugs for the Egyptian pilgrims was exhausted, owing to the importunate demands of the notables of Mecca, before Jedda was reached on the return journey. In consequence the Egyptian Public Health Department is drawing up a scheme for a properly organised system of treatment and hospitalisation for its own pilgrims and hopes that the Governments of other countries from which pilgrims go will do likewise. No epidemics were reported from the Hedjaz during the 1921 pilgrimage. One returning Egyptian pilgrim was found to be suffering from cholera at the quarantine station at Tor. The Egyptian pilgrims were, as usual, carefully traced on their return to Egypt and those who showed any intestinal symptoms whatever had their stools bacteriologicallly examined. No further case of cholera occurred. During the pilgrimage a bacteriologist and a laboratory attendant are sent to the Suez laboratory to carry out the necessary examinations in connexion with returning pilgrims. Patrols are maintained in Sinai and on the Red Sea littoral to prevent Egyptian pilgrims returning by an unauthorised route to escape quarantine. The Sinai patrols intercepted 21 pilgrims. A regulation is in force prohibiting the entry into Egypt of returning non-Egyptian pilgrims, and difficulties arose in 1921 through other Governments having made no shipping arrangements for the return of their nationals to countries north of Suez. Obviously the whole of the precautions of the Egyptian Government with regard to Egyptian pilgrims will be of little avail if foreign returning pilgrims are allowed to trickle through the country uncontrolled. The Governments concerned should either provide direct sea transport or make financial provision for controlled land transport and repatriation of their own nationals. Medical control of a pilgrimage from each country of origin, on the lines of the existing Egyptian arrangements, would do much to reduce the present constant menace to the world's health.

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[1] Calcutta: Superintendent Government Printing, India. 1923. As.6.

[1] Report of the Ministry of the Interior on the Health of Egypt, 1921.

THE PATHOLOGY OF LEGG'S DISEASE.

THE disease of the hip-joint associated with the names of Legg, Perthes, and Calvé has been recognised as a clinical entity since 1909, but its causation and pathology are still in doubt. The disease is not fatal, nor does it, as a rule, necessitate operative intervention, and therefore material for examination has been difficult to obtain. Histological examination of one case (Fründ) showed that the spongy tissue of the head of the femur was completely necrosed, while the cartilage remained intact and living. Prof. A. Nussbaum,[1] of Bonn, confirms this statement, and has produced exactly the same result in young dogs by division of the blood-vessels supplying the head of the femur. Microscopic examination revealed necrosis of the spongy tissue of the epiphysis, characterised by lack of staining of the nuclei of the bone cells in the marrow and cortex. The cartilage, on the other hand, remained in good condition, as shown by perfect staining of the nuclei and thickening of the cartilage, thus demonstrating that cartilage can live without its direct blood-supply, and must be nourished by the synovial fluid. In healthy well-nourished epiphyses the newly-formed cartilage is ossified by the endochondral type, and growth progresses evenly; but when the circulation is interfered with the columns of cartilage cells are no longer ossified by the ingrowing blood-vessels, but grow irregularly on top of the bone already formed, producing tongues and islands of cartilage dipping down into the spongy tissue. These tongues and islands correspond to the clear areas seen in the X ray. The diminished ossification of the cartilage explains its thickening, which is shown in the X ray by increase in the width of the joint cavity. Later, regeneration of the head takes place by new blood-vessels growing in with connective tissue developed from the synovial membrane. These experiments prove that Legg's disease is due to a primary necrosis of the head of the femur caused by an interference in the blood-supply, the cause of the latter being still unknown. Prof. Nussbaum suggests that the name the disease usually bears on the continent (osteochondritis coxæ juvenilis) is false, and should be replaced by necrosis capitis femoris.

ATMOSPHERIC POLLUTION.

THE eighth report of the Committee for the Investigation of Atmospheric Pollution provides much valuable information obtained from systematic analyses of impurity deposited from the air at about 30 experimental stations in different parts of the country. The first six reports appeared as supplements to THE LANCET; the present report covers observations for the year ended March 31st, 1922. As investigations on these lines have been carried out for a series of years it has been possible in the case of most stations to include in the report a comparison between the deposit collected during the current year and the average results of the past five years. In nearly all stations the quantities deposited during the year were below the average. Comparison between summer and winter deposits show that the summer total was less than the winter in 14, equal in three, and greater in five cases. From the records of Dr. J. S. Owens's automatic instrument figures showing the amount of suspended matter at each hour of the day and night have been prepared for London and Rochdale, and graphs of the average values over long periods indicate the remarkable parallelism between impurity and the periods of activity of domestic fires. Other curves showing the variation of pollution at three London stations on different days of the week bring out the effect of local smoke production on the state of the air. The effect of the coal strike of 1921 upon the maximum amount of suspended impurity in London air is shown in another figure. Experiments in Rochdale to ascertain what proportion of the impurity was produced locally and what was carried there by air currents show that only 15 per cent. of the matter deposited at the centre of the town was brought there by the wind. Dr. Owens's new portable instrument has proved of good use for the rapid collection of suspended atmospheric dust in a suitable form for examination and counting under the highest power of the microscope. Photomicrographs of some typical specimens of impurity magnified up to 2000 diameters are given in the report, and a useful bibliography of the measurement of dust by various methods is added. Special interest attaches to this report owing to the hope that the problem of atmospheric pollution is to receive serious consideration in Parliament in the near future. The Government are pledged to legislate upon the matter, and one of the proposals of the Bill introduced into the House of Lords by Lord Onslow on behalf of the Ministry of Health runs as follows:—

> "The powers of the urban authority . . . shall extend to the making of bye-laws requiring the provision in new buildings *other than private dwelling houses* of such arrangements for heating as are calculated to prevent or reduce the emission of smoke."

This Bill will come before Committee when the House of Lords reassembles in November, and, although it is an earnest of official interest, the measure as drafted falls short of what is regarded by some as essential. At present Government premises enjoy a complete immunity from prosecution as regards nuisances; they should be brought into line with other industrial concerns. Suggested concessions in favour of the iron and steel trades arouse misgiving, for clearly the Bill should retain such advantages as the present law possesses until replaced by something better. The report deals exclusively with measurement and makes no suggestions as to the mitigation of the smoke evil, which is a problem outside the sphere of the Advisory Committee. But exact measurement is an essential step towards improvement and the usefulness of the report cannot be questioned.

THE TRAINING OF MIDWIVES.

THE numbed bewilderment of a flock of prospective midwives being questioned by a member of the honorary staff on an official round has often excited the compassion of the more hardened medical students who may be present at the ordeal. The recommendation by Dr. Janet Campbell in her report on the Training of Midwives (H.M. Stationery Office, 1*s.* 3*d.*) that the minimum training period for unqualified women should be 12 months, and that for trained nurses should be extended from four to six months, will be welcomed by all who have watched these pitiful rounds. For untrained women, who have to gain practical experience of asepsis and antisepsis, as well as to grasp the principles of midwifery, to master in six months the present curriculum is obviously too heavy a task. The examination embraces 17 essential subjects, of which one alone, *the symptoms, mechanism, course, and management of natural labour*, must include a clear conception of the stages of one of the most elaborate physiological processes in the body, almost as puzzling to the clinical student as were the folds of the peritoneum in his dissecting-room days. Dr. Campbell does not advise the extension of the time period without careful consideration of possible disadvantages, which she enumerates, but concludes that it is inevitable if higher standards of practice are to be expected. In considering the curriculum she notes that the nursing of puerperal women is often less efficient than it should be; in such concentrated training it is easy to neglect the unsensational routine of maternity nursing apart from actual delivery. Antenatal work has also been dealt with too lightly in the past; comparatively few midwives now in practice have had any useful training in this respect, and probably for this reason fail to make full use of the maternity welfare clinics. The feeding, care, nursing, and management of premature or diseased infants are special branches of her profession of which the midwife should also have practical experience. Unfortunately the colleague responsible for her training is not always really qualified to impart such complete equipment. To provide against this possibility, Dr. Campbell suggests the institution of a special certificate for teachers, not necessarily to eliminate the approval of practical midwives in this capacity, but to ensure that a teacher shall have the necessary degree of personal education and a knowledge of more recent developments of midwifery, as well as facilities and equipment for undertaking a 12 months' course of training. The majority of practising midwives, though competent and successful in their work, have not these qualifications; their teaching is still further limited by the possible susceptibilities of their patients, and they cannot afford to risk damaging their own practices by such methods as, for example, systematic antenatal supervision, which might annoy or alienate the women attended. The certificate for teachers would not imply any overstepping of the legitimate functions of a midwife and would, we consider, be an excellent step. Of more doubtful utility is Dr. Campbell's suggestion to register and thus recognise "handy-women." She does not propose that any qualification should be required for registration, but merely that suitable women engaged in maternity nursing should be accepted. Any unregistered woman found undertaking this work would then be liable to prosecution. The only requirements upon which it would be possible to insist in all cases are good character, personal cleanliness and physical fitness, temporary or permanent suspension from the register following proved unfitness in any of these respects. Dr. Campbell does not believe that registration would enhance the status of the handy-woman, but that the inconvenience of being subject to suspension by, say, the inspector of midwives, would act as a discouraging factor on her employment. We have some qualms, however, about her hopeful suggestion that difficulties would not arise over the inspection of unqualified women working directly under a doctor; nor do we anticipate that those fully trained monthly nurses who are not midwives would appreciate being enrolled in the same list as quite untrained women. It is not easy to see how best to relegate the handy-woman to her proper function of home-helper, but though the advantages of registration, as outlined by Dr. Campbell, are not inconsiderable, we do not think this proposal will meet with general approval. A section on the midwife and the public health service concludes an admirable report.

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[1] Deutsche medizinische Wochenschrift, June 29th, 1923.

Dr. Andrew Balfour resigns on Oct. 31st his post as Director-in-Chief of the Wellcome Bureau of Scientific Research to take up other important duties. He will be succeeded by Dr. C. M. Wenyon, who for the past nine years has been Director of Tropical Research at the Bureau.

WE regret to announce the death, on Sept. 8th, of Mr. Gustavus Hartridge, ophthalmic surgeon to Westminster Hospital, and gratefully known to many generations of students for a lucid manual on the refraction of the eye.

Modern Technique in Treatment.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

XXXVI.

MENORRHAGIA IN YOUNG WOMEN WITHOUT GROSS LESION.

THE menstrual function is governed by internal metabolic changes of which hæmorrhage from the endometrium is but the outward and visible sign. The unseen and little understood metabolic processes naturally tend to be overlooked and the uterus, particularly its mucous lining, regarded as the organ at fault in menstrual disorder. It is curious that while amenorrhœa and scanty menstruation are accepted as due rather to general bodily states, such as malnutrition, anæmia, &c., excessive or painful menstruation is usually ascribed to deviation in the position of the uterus or disease in the endometrium, so that alteration of position and curetting have had an undue prominence in treatment.

It is essential in the first place to make sure of the precise nature of the trouble. Patients often seek advice because their normal habit is in excess of the average and, though perfectly well, think the loss is greater than it should be. Such patients require no treatment; it should be explained to them that their type is natural to them, although above the average in quantity or duration. On the other hand, definite change in the menstrual habit in the direction of excess is an indication of disturbance whether it causes symptoms or not, and the general health and circumstances of the patient call for investigation. If the menorrhagia is a symptom of organic disease, renal, cardio-vascular, or suchlike, the treatment will be that of the primary condition, but the vast majority of cases do not exhibit serious organic disease, and the most common provoking factors are those of a nervous and psychical origin or a change in the mode of life or occupation, as, for example, from a healthy outdoor life in the country to a sedentary occupation in town. Here treatment must consist chiefly in advice on how best to order the patient's present mode of life so as to remove the causes predisposing to her trouble. Unless this can be done no medicinal or other treatment will avail. The shop assistant or waitress on her feet all day in a stuffy atmosphere may obtain some benefit from physical exercise at her off times, if not too tired to enjoy it, from regulation of the bowels and other general hygienic measures, but unless she can continue at work through her periods she will not be able to keep her place. If the menorrhagia persists she must, at any rate for a time, give up work, when probably her natural habit will soon return. Ergot, calcium lactate, and the cotarnine salts are disappointing; generally the most valuable drugs are the bromides, but they are rarely successful unless the patient can rest at the time of the period. Improvement of the physical condition is essential, and the best possible use must be made of the intermenstrual period. The cases that respond most readily to hygienic treatment are those with excessive loss with normal intervals; the troublesome cases are those with shortened clear intervals.

Though less serious in its effects, the type in which a slight discharge—often termed "draining" or "dregs" by the patient—persists after the free loss has ceased is particularly difficult to treat; it is common in nervous women and causes them much mental distress. The continuance of a slight discharge should not be allowed to interfere with outdoor pursuits, and if once the patient can be persuaded to concentrate on her physical condition and not on her ailment, the likelihood of her recovery will be greatly increased. Curetting is rarely of use, but may be tried in those over the age of 25, in whom other measures have failed; the possibility of an intra-uterine polypus or general endometrial hyperplasia makes one curetting worth while, but the factor producing the endometrial overgrowth, if not removed, will sooner or later cause a return of the condition. However, inasmuch as curetting affords an excuse for rest in bed, followed by a holiday, it may be the means of giving the patient a fresh start. Probably a judicious use of this time will do more than the operation itself.

The Endocrine Glands and Menstruation.

In spite of the extensive literature on organotherapy in menstrual disorders, our knowledge of endocrinology is as yet too fragmentary to admit of a rational basis for therapeutics; what is attempted is either empirical or speculative. Dr. H. Gardiner-Hill is now undertaking at St. Thomas's Hospital a study of the menstrual function in gross disorders of certain endocrine glands in the hope that it may lead to recognition of an endocrine factor in the less obvious cases. Apart from the ovaries, where abnormalities of function are difficult to assess, the endocrine glands chiefly associated with menstrual disorder are the thyroid and pituitary. Divergent views still exist as to the nature of this relationship and even as to the type of menstrual derangement likely to occur in gross disorders of these glands. The uncertainty arises partly from the difficulty of excluding abnormalities of other endocrine glands. The disordered menstruation accompanying gross disorders of the thyroid and pituitary glands may, indeed, be independent of a specific action of the hormones concerned, since profound alterations in the general metabolism are also produced. Both menorrhagia and amenorrhœa have been described as accompanying both hyper- and hypo-thyroidism. The general opinion seems to be that, while the majority of cases of Graves's disease show a tendency to diminished menstruation or amenorrhœa, if any irregularity at all is present, the majority of cases of hypothyroidism show a tendency to menorrhagia. The stage at which the condition arises, however, may be a factor of importance. The absence of the thyroid hormone in the cretin is generally held to be responsible for lack of development of the genitalia, and consequent amenorrhœa; if treated, however, the cretin appears to commence menstruation about the average age. Minor degrees of hypothyroidism, especially if the onset is in early adolescence, seem to give rise to early menstruation and a tendency to menorrhagia; at the onset of myxœdema in adults the menstrual tendency seems also to be in the direction of excess rather than deficiency. On the other hand, amenorrhœa is often stated to accompany myxœdema, possibly because myxœdema frequently arises at the time of the menopause, artificial or natural. An important relation undoubtedly exists between the pituitary gland and ovarian function, but how far pituitary disturbance can be a cause of menorrhagia is little known, except that in the early stages of acromegaly with anterior lobe hyperplasia overgrowth of the genitalia with menorrhagia occurs and is soon followed by the opposite phase of decreased sexuality and amenorrhœa.

In gross disturbance of the thyroid or pituitary gland menorrhagia is not usually the most prominent symptom. When, however, menorrhagia is a major symptom and gross thyroid or pituitary derangement not obvious, the possibility of some minor endocrine disturbance should be borne in mind, notably in cases occurring at the physiological epochs, such as puberty, after childbirth, or the menopause, especially if any toxic condition is superadded. If signs of endocrine disturbance are noted, an estimation of the basal metabolic rate provides a valuable indication of the existing state of function of the thyroid gland.

Abnormal conditions of the pituitary gland will usually be accompanied by disturbance of growth and metabolism. The patient's height and weight should be compared with the average normal for her age. Radiographs of the sella turcica should also be taken in doubtful cases, while estimations of sugar tolerance may provide additional evidence of pituitary disturbance.

Organotherapy.

The above factors must all be taken into consideration when considering the likelihood of success of organotherapeutic measures in menorrhagia. Up to the present three organic extracts have been chiefly used with varying results. These are thyroid extract, pituitary extract, and extracts of the corpus luteum. The empirical treatment of excessive, scanty, or absent menstruation by thyroid extract is sometimes followed by the return of normal menstruation, and at the climacteric by diminution of the general disturbances associated with this period of life. Thyroid extract is, however, a powerful stimulant to metabolism in general, and possibly these results are due to a general improvement in nutrition. Basal metabolism estimations would appear to provide the best guide as to the need for, and dosage of, thyroid extract in these cases. It should be tried in small doses, ¼ to ½ gr. at night to start with, and gradually increased as the indications arise. As to pituitary extract, the general opinion seems to be that results are disappointing, and when successful may be due to the well-known local action of pituitary extract on the uterine muscle. The recent work of W. E. Dixon suggests the likelihood of menorrhagia occurring with hyperactivity of the pituitary, and pituitary extracts have been recorded as producing good results in cases where ovarian function is deficient. Extracts of corpus luteum have also been used, chiefly by American observers, on the supposition that one function of the corpus luteum is the checking of the menstrual flow. Good results have occasionally been obtained, but apparently in menorrhagia during later, rather than earlier, menstrual life. Our knowledge of the properties of extracts of corpus luteum, however, is as yet meagre, and their administration is, to say the least, speculative.

Conclusion.

The treatment of these difficult cases may be summed up thus. Reliance must be placed chiefly on general and hygienic management of the patient, especially in regard to removing unfavourable conditions in her life and occupation and promoting good physique; curetting is of little use as a therapeutic measure, and more often required for diagnosis in patients after the age of 25–30 than in younger women. Drugs are rarely of use, except perhaps sedatives when there is nervous and psychical disturbance. The organic extracts are occasionally of use, but further investigation will be necessary before a scientific basis is obtained for their administration.

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Special Articles.

MEDICAL EXAMINATION OF DRUNKEN MOTOR DRIVERS.

WORKING OF THE NEW LAW IN DENMARK.

No one denies that the drunken motor driver is a dangerous nuisance. But to deal with him in a manner that is both effective and fair to all concerned is no easy matter. To fine him or lock him up for a month is often merely to temporise and put off the evil day—the second occasion when his tendency to get drunk may mean the death of one or more of his fellow beings. In this country we seem to be moving towards the rule that the motorist once convicted of drunkenness while driving must lose his licence for ever. This rule has already become law in Denmark, the law of 1918 having been revised in 1921 in such a way that, according to paragraph 34, the motorist convicted of drunkenness while driving may have his licence permanently withdrawn. Paragraphs 32 and 34 of this law of 1921 refer to two degrees of alcohol poisoning—"drunkenness" and "being under the influence of alcohol." As there is, of course, no hard-and-fast line between severe and slight intoxication, it soon became evident to the police in Denmark that, if the new law was to be administered justly and effectively, certain standards and criteria would have to be formulated, and soon after the law came into force they solicited the aid of the Danish Medico-Legal Council. An account of the correspondence which followed and of the practical outcome thereof has recently been given by Dr. J. Fog in *Ugeskrift for Laeger* for August 23rd.

In his letter to the Medico-Legal Council, the chief of police pointed out that the decision whether a motorist is drunk or sober has become a most serious matter since, in the former event, the motorist's career may be permanently terminated. It was therefore felt by the police that in cases of alleged drunkenness in drivers, a medical examination is essential. But the police felt it incumbent on them to point out that examinations for drunkenness by medical men had not been carried out in the past on a uniform system, nor had the wording of the reports of such examinations been invariably clear. Hence the difficulties which the police and legal authorities had had in acting on the reports of medical examiners. It was therefore hoped that the Medico-Legal Council would help to clear up this state of affairs and assist the police in choosing a medical expert who would be at the service of the police day and night. In answer to this appeal from the police, the Medico-Legal Council engaged the services of an alienist, Prof. A. Wimmer, and of a pharmacologist, Prof. J. C. Bock, to help work out a detailed scheme to be followed by a medical examiner called on to investigate an alleged case of drunkenness. In the reply of the Medico-Legal Council to the chief of police, it was pointed out that while definite tests could be devised for distinguishing between drunkenness and complete sobriety, the detection of the slighter degrees of alcohol poisoning was a matter of great difficulty. The Council's proposed tests referred therefore only to the diagnosis of definite drunkenness. These tests, it was pointed out, may be classed under three headings: (1) Chemical examination of the blood and urine; (2) psycho-physical examinations; (3) an ordinary clinical examination. In the case of the arrested motor driver, the Council came to the conclusion that only a clinical examination is necessary in practice, and the following programme was devised as a guide to the examining police surgeon, the scheme being sufficiently detailed for any doctor to carry out the examination to the satisfaction of the authorities.

1. Observe the driver's appearance. Drowsiness, drooping eyelids, relaxed features, congestion of the face and conjunctivæ, sweating, slobbering, disordered dress, and the like should be noticed.
2. Observe his behaviour. Noisiness, silly behaviour, excitation, garrulity, restlessness and other characteristics should be noticed.
3. Is his sense of time and space natural? If it is, say "Yes," if not, repeat his statements.
4. Test his memory. Note if he can remember a couple of addresses, and test his ability to describe something—i.e., how the motor accident happened, or the meaning of a drawing in an illustrated paper.
5. Note his speech: is it thick, nasal, lisping, or stammering? Let him repeat difficult words or read aloud a short notice in a paper.
6. Note his gait. Swaying and ataxia should be noticed, and Romberg's test should be carried out.
7. Test the movements of his hands and also his handwriting, telling him to write his name, age, station in life, and address on a sheet of paper.
8. Note if his pulse is regular and rapid, the condition of his pupils, and his response to painful stimuli.
9. Note if he smells of alcohol.
10. Are there signs of other diseases such as epilepsy and apoplexy?

Dr. Fog was charged with the task of putting this scheme into practice, and he has already examined 50 alleged cases of alcohol poisoning in motor drivers. The account he gives of these examinations shows what an elaborate process the Medico-Legal Council has devised. The average duration of a single examination is about 45 minutes. The medical examiner loses no time lest the condition in which he finds the driver should have changed since his arrest. The interview between the driver and the medical examiner is, as a rule, conducted in the absence of a third person, and the examiner hastens to assure the driver that he, the examiner, is a neutral, unbiased party, anxious only to find out the truth. In the quiet atmosphere of this tête-à-tête meeting, the driver, whose excitation is solely due to an accident and the events following it, soon settles down and carries out the various tests satisfactorily. On the other hand, the drunken driver who has been temporarily sobered by the shock of an accident and the prospect of losing his licence for ever, may at first pull himself together to pass certain tests. But the maintenance of such artificial sobriety for the better part of an hour is an almost impossible task, and if he is really drunk, the driver sooner or later betrays himself.

With regard to the value of the tests devised by the Medico-Legal Council, Dr. Fog has found that the fourth test is very delicate; none of the drivers classified as drunk, and hardly any classified as suffering from slight alcohol poisoning, could pass this test satisfactorily. But the fifth test, which also included sums in arithmetic, was of less value. Two drivers, who were found to be sober, could not pass simple arithmetical tests. Handwriting tests proved of little value, for the handwriting of comparatively uneducated men may be bad, however sober they are. As for the pulse-rate, it was of practically no value. Indeed, the average pulse-rate of the drivers discharged as sober was a little higher than that of the drivers declared drunk or suffering from slight alcohol poisoning. Test 9 was of value only when negative; merely to smell of alcohol is of little diagnostic value. All the three drivers not smelling of alcohol were discharged as sober.

Dr. Fog's classification of his 50 cases brings out some interesting points. All the drivers were men, and the age of 41 of them was between 20 and 39. There were 34 professional chauffeurs, and 16 amateur or private drivers. In as many as 34 cases an examination was required between 8 P.M. and 8 A.M., and in 19 of these cases an examination was required between midnight and 6 A.M. Only 9 of the 50 drivers were discharged as sober. Of the remainder, 11 were classified as drunk, and 30 as suffering from slight alcohol poisoning. It is evident from this interesting paper that, under conditions obtaining in Denmark, the medical examination of a motor driver accused of drunkenness is so elaborate and systematically carried out that there is little chance of a miscarriage of justice.

WHAT DOES THE PUBLIC HEALTH SERVICE DO FOR ME?

DISSEMINATION OF HEALTH INFORMATION IN U.S.A.

THE Federal Public Health Service of the United States of America has issued a series of leaflets intended to be read by the older scholars in upper grade and high schools. It has been prepared to meet the general demand for information in regard to the health work now being done by both National and State authorities. The discussion is in six parts, three being subdivided into two sections each, their average length being about 650 words each. The first part is introductory and its purport may be gathered from the extract below. In the second part we are told what the public health service does for the young, and the work of vaccination, of child welfare organisations, of school examinations, and the like, is described. In the third part precautionary measures in regard to travel are noted; in the fourth part we are informed how the public health service protects from communicable diseases. The fifth part deals with the solution of interstate health problems, including paragraphs on standardisation of special products. In the sixth part some portions of industrial hygiene are emphasised. The following extracts will serve to indicate the scope of the whole.

On the Dissemination of Knowledge.

Dissemination of health information is enormously important. Other countries, of course, disseminate it; but they do it chiefly for professional men, doctors, bacteriologists, and not until recently for the benefit of the "man of the street." The U.S. Public Health Service, on the other hand, addresses all the people. Some very technical publications are especially for the benefit of scientists, but by far the greater part of its publications deal with subjects that interest the everyday man, and with some that interest the everyday youth.

It disseminates information concerning new investigations, new discoveries, and new methods, by means of printed books, newspaper articles, radio broadcasts, public lectures, demonstrations, and school-children. Dissemination by children is very important; for when children learn a thing they can be relied upon to educate their parents.

The task of State health authorities, on the other hand, is to collect vital statistics (records of births, deaths, diseases, &c.); to prevent disease by vaccination, inoculation, and house quarantine of the sick; to supervise drinking water, milk, food, sewers, street sanitation, school sanitation, &c.; to inspect factories, workshops, &c.; and in some States to provide school nurses and school physicians.

Broadly spreading, the U.S. Public Health Service finds out things and the State and local health authorities apply them; though, of course, the State and local organisations find out a good many things and the Public Health Service applies a good many. Whichever way they work, however, they work together and get the maximum efficiency.

Foreign Quarantine.

Most important of the direct work for protection against disease is that of barring foreign diseases from our shores. This was almost the first duty undertaken by the Public Health Service, which was organised 125 years ago under the name of the Marine Hospital Service and charged with the medical and surgical care of merchant seamen. Owing to this duty it was usually the first to discover any disease brought from abroad. From this the Quarantine Service of the U.S. Public Health Service developed.

The States, of course, had control of their ports and at irst most of them established their own quarantines. Later, however, it became evident that the National Government was best fitted for carrying out such work; and one after another the States turned over their stations to the Public Health Service. New York, the last, fell in line about two years ago.

Some years ago the quarantine work of the Service was divided into two parts—foreign and domestic. Foreign quarantine has to do with diseases coming from abroad and domestic quarantine with the spread of disease among the States.

The Public Health Service has two lines of defence against foreign diseases, one abroad and the other at home. n all, 77 officers man the first line, 31 in Europe, 2 in South America, 7 in Mexico, 3 in China, 19 in the Philippines and Hawaii, and 15 in Cuba, Porto Rico, the Virgin Islands, and Panama. These officers are stationed at as many sea ports, where they are charged with preventing the sailing for America of emigrants infected with diseases, especially with typhus, cholera, plague, and yellow fever.

In Europe the task has of late years not been easy. The would-be emigrants were mad to get to the United States; and their native countries were for the most part glad to have them go; and some of the steamships were not averse to carrying them, but were averse to spending money for delousing plants, &c. The Public Health Service could not directly compel them to do this, nor could it everywhere do it itself, for some European countries objected on the ground that in setting up the necessary facilities the United States was encroaching on their sovereignity.

The Public Health Service had to counter by requesting the State Department to instruct its consuls in Europe to refuse a bill of health to vessels sailing for the United States with passengers who had not been subjected to cleansing measures and by instructing its own quarantine officers to delouse immigrants on arrival in this country and to detain them, in case of suspicion, for 12 days thereafter. Only by this action were some steamship companies induced to instal disinfecting plants abroad. Aided by the present restrictive immigration law and by the disinfecting and delousing facilities, conditions are now reasonably satisfactory. The restrictive law is, however, until July 1st, 1924, only, and unless it is renewed or in some way replaced the tidal wave of immigrants waiting in Europe for the letting down of the bars will rush for this country at the first opportunity and the resulting pressure will test every timber in the health barricade.

Leprosy.

According to the best estimates there are now in the United States 500 to 1500 lepers, a mere bagatelle compared with those suffering from tuberculosis, which is for that matter far more contagious and far more deadly. Nevertheless, knowledge of the presence of a leper in a street car, for instance, would cause a panic and that of a tuberculous patient could cause scarcely a thrill.

Public opinion has insisted that the Federal Government shall take charge of all lepers, and it has undertaken to do so.

In 1917 Congress provided for a national home for lepers to be administered by the Public Health Service, but so strongly did the various States object to its location within their borders that it was not until four years later that the Service was able to acquire a leper home (in Louisiana). This home is still being enlarged, and each new ward is rapidly filled. The Public Health Service, on application from a proper State authority may accept as a patient at this home any leper found in any State, with the exception of aliens subject to deportation from the country. This protects you in steadily increasing measure against possible contact with lepers who are at large.

Leprosy has been found in a measure amenable to treatment. Nearly one-third of the patients at stations in Hawaii have been released as being no longer a menace to public health, and of these only about one-eighth have relapsed.

Examination of Biological Products.

Some years ago Congress assigned to the Treasury Department operating through Hygienic Laboratory of the Public Health Service the duty of making tests of "biological products" and of inspecting the factories where these "products" were manufactured. No bacteriological product may be shipped in interstate commerce not bearing the indorsement of the Laboratory. This indorsement is, of course, not as to the medicinal value of the product but is merely as to its strength, toxic properties, and the sanitary conditions under which it is manufactured.

Most States have officially adopted the Public Health Service standards; but some still allow the manufacture within their border of products whose manufacturers are unwilling to submit them for testing or their factories for inspection. Such products may not be shipped from State to State.

The Public Health Service has standardised products for use against diphtheria, lockjaw, dysentery, meningitis, pneumonia, and typhoid.

Within the last 20 years the death-rate from diseases now treated by bacteriological products has been enormously reduced. Small-pox, except where vaccination has been neglected, has been almost abolished; meningitis to about one-sixth and diphtheria to less than one-third; rabies, if taken in time, can almost always be prevented; tetanus has been greatly reduced.

Medical Departments in Industrial Plants.

The establishment of medical departments in most of the industrial plants of the country was also in part due to the Public Health Service. Such departments attend not only to employees who are injured in accidents or who are taken sick at the plant, but they also investigate the causes of any disease that breaks out in the plant and eradicates it, thereby making the factory more healthful and reducing absenteeism and the cost of finding new men to replace those who quit. They keep records, too, from which the Public Health Service may work out, as soon as enough are available, a health standard based on the normal or average amount of absence from work on account of sickness. Such a standard is expected to bring about important improvements in factories that find themselves below par.

The effect on the physique and health of industrial workers, especially women, resulting from the monotonous and rapid repetition hour after hour and month after month of movements in themselves light and simple, is now being investigated.

The Public Health Service is of opinion that, so far, though conclusive proof is lacking, it is probable that serious injury may be caused by any work, the performance of which calls for cramped, constrained, or awkward posture. Less certain is the effect of such work on the nervous system. That the constant repetition of a movement does in time affect this system is more than probable, but how importantly it affects it has not been established. This investigation will almost certainly result in great benefits to working women.

VITAL STATISTICS FOR 1921.

THE REGISTRAR-GENERAL'S REVIEW.

The text of this Review,[1] being one of three volumes comprising the entire survey, is now published one year and eight months after the termination of the year to which it relates, and many months after the publication of the tables which are necessary for complete study of the present volume. It contains the valuable, chiefly medical, commentary on the vital statistics for the year 1921.

A Phenomenally Low Death-rate.—As in the previous year (1920) there was experienced also in 1921 a lower death-rate than in any previous year since 1837, the main explanation of this being a succession of two exceptionally mild winters. Had the death-rate for 1921 been stated in terms of the standard population recommended by the International Statistical Institute it would have been 12·5 instead of 11·5 per 1000.

Comparison of the Two Sexes.—Much interest attaches to the relative mortality of the two sexes at various periods of life for equal numbers living. Reference to Table III. in another volume shows, as pointed out in this report, that prior to 1920 in no year was the death-rate at ages 85 and upwards higher in females than in males, as it was in 1921 (in the proportion of 100 to 95). At ages under 5 in the same year the male death-rate was 25 per cent., at ages 5–10 it was 3 per cent., at ages 15–45 it was 16 per cent., at ages 55–65 30 per cent., at ages 65–75 21 per cent., and at ages 75–85 14 per cent. higher in males than in females. There remains the age-period 10–15, in which male mortality was 3 per cent. lower than that of females, a phenomenon which, with few exceptions, has held good for many years.

Infant Mortality was at the rate of 83 per 1000 births, lower than in any previous year except 1920, when the deaths numbered only 80 per 1000 births. The hot dry summer of 1921 might have been expected to cause a large excess of diarrhœal diseases, but the amount of these diseases was well below the average of all years preceding 1915, though higher than in the more recent years preceding 1921. The valuable tables given on pages 6 and 7 of this Review are worthy of detailed study by all hygienists. They show, inter alia, the error of the commonly accepted statement that the death-rate in the first four weeks after birth has not declined. It was 40·6 in 1911 and 35·2 in 1921, and the variations in different localities were much greater than are indicated by these average rates for the whole country. In the next two months of infancy the death-rate between 1911 and 1921 declined from 24·7 to 14·7, in the third to the sixth month from 25·9 to 13·7, in the next three months from 20·6 to 9·7, and at 9–12 months from 17·4 to 7·8. In another table is shown the influence of urban life on infant mortality. In the first four weeks urban excess over rural was 7 per cent., in the next two months it was 25 per cent., in the third to the sixth month 49 per cent., and in the two next three-monthly periods 44 and 48 per cent. respectively.

The *Regional Distribution of Infant Mortality* has great importance. In the north of England as a whole it was 38 per cent. higher than in the south, an excess which is greater than the excess of infant mortality in county boroughs over that in aggregate rural districts. It is marked even in the first day after live birth (20 per cent.), and it amounts to 34 per cent. in the first four weeks after birth, and there is therefore opened up here a region for investigation by medical officers of health which should bear fruit, especially in improved care of mothers before, during, and after childbirth.

Deaths from Suffocation.—Up to the year 1914 accidental mechanical suffocation had varied little during 30 years. It declined rapidly in 1915 and 1916, and since then has fallen from 1·40 per 1000 births in 1914 to 0·59 in 1921. (To see the progress of events year by year it is necessary to refer to another volume.) Furthermore, while in past years mortality from this cause was much greater in the south than in the north, and especially excessive in London, the decreased mortality is not very unequal in all parts of the country. It is difficult, as is said in the report, to dissociate this change entirely from the war, and the decreased consumption of alcohol at once suggests itself as a possible explanation; though it appears not unlikely that some change may have taken place in the attitude of coroners to suspected cases investigated by them.

Increase of Excess Mortality of Male Infants.—As is well known, male infant mortality is always higher than female. Owing to the fact that comparing, for instance, 1881–90 with 1921 the male infant death-rate has declined only 45, while that for females has declined 48 per cent., the difference between the two sexes is slowly increasing. The excess in the mortality of males is greatest in the earlier months of infancy, and as the recent fall in infant mortality has occurred chiefly in the later months, this in itself explains some of the increased difference between the mortality in the two sexes. In this connexion it is necessary to think of early infant mortality as partly avoidable and partly inevitable, and if it be assumed, as is not unlikely, that a larger proportion of male than of female infantile deaths are in the latter category, it follows that reduction of infant mortality must be associated with an increased difference between male and female infant mortality. A comparison of the cause of events in other countries shows no movement in the opposite direction, although in only a few of the countries whose experience is quoted in the Review is there as large an increase in male excess as in this country.

(*To be continued.*)

Royal Institute of Public Health.—A course of lectures on Problems of Personal and Public Health will be delivered in the Lecture Hall of the Institute, 37, Russell-square, London, W.C., at 4 P.M. on Wednesdays, beginning on Oct. 17th. Among the lecturers will be Dr. Alfred Greenwood, Prof. J. C. Drummond, Major H. Graeme Anderson, Dr. W. A. Bullough, Mr. William B. Smith Dr. C. W. Saleeby, Dr. Kate Platt, Dr. A. H. Bygott, and Mr. H. D. Herring.

The Harben Lectures will be given by Prof. C. Levaditi, M.D., of the Pasteur Institute, Paris, on Dec. 11th, 12th, and 13th on: (*a*) Neurotropic Virus (Encephalitis); (*b*) Neuro-vaccine; (*c*) New Discoveries in the Treatment and Prophylaxis of Syphilis.

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[1] The Registrar-General's Review of England and Wales for the Year 1921. (New Annual Series, No. 1. Text.) H.M. Stationery Office. 5*s*.

IRELAND.

(FROM OUR OWN CORRESPONDENT.)

Health of Belfast.

THE report of Dr. H. W. Bailie, medical superintendent officer of health for the year 1922, has just been issued. The general improvement in the health of the city is shown by the fact that the total number of deaths in 1922, viz. 6304, with a population of 425,000, is less than the number, viz. 6910, in the year 1892, with a population of 261,046, the respective rates being 14·8 per 1000 and 26·5 per 1000. The rate for 1922 shows a fractional increase over the previous year—14·8 compared with 14·4 per 1000. Typhoid fever, which was formerly very prevalent, has almost disappeared. The number of cases was 75 with 7 deaths, a mortality of 9·3 per cent. No case of typhus fever occurred during the year. Scarlet fever was prevalent but in a very mild form. There were 741 cases with 12 deaths, a mortality of 1·6 per cent. Diphtheria was also prevalent. There were 497 cases with 43 deaths, a case mortality of 8·65 per cent. Measles caused 33 deaths, equivalent to a death-rate of 0·08 per 1000 of the population. Whooping-cough caused 16 deaths, equivalent to a death-rate of 0·04 per 1000 of the population. Diarrhœa caused 152 deaths, equivalent to a death-rate of 0·36 of the population; of the total number 127 were children under 2 years of age, and 25 were 2 years of age and upwards. There were 8 cases of cerebro-spinal fever with 3 deaths. Influenza caused 241 deaths. Phthisis caused 624 deaths, a rate of 1·5 per 1000. Pneumonia caused 594 deaths, a rate of 1·4 per 1000. Cancer caused 363 deaths, a rate of 0·9 per 1000. There was a reduction of 0·8 per 1000 in the death-rate from zymotic diseases, and an increase of 0·4 per 1000 from chest affections compared with the previous year. The birth-rate was 25·1, a decrease of 1·2 compared with the previous year. Infant mortality was 94 per 1000, or 21 per 1000 less than the previous year. The natural increase of the population was 4363. At the out-patient clinics for venereal disease 2376 cases were treated, and 420 patients received treatment as in-patients. The total cost of treatment of persons suffering from venereal diseases was £6544 5*s*. 8*d*., of which 75 per cent. of the cost incurred was recouped to the corporation. The number of houses disinfected during the year was 1882. Five maternity and child welfare centres were in operation. The number of names upon the rolls was 24,287. Of 16,503 cows slaughtered during the year 35, or 0·21 per cent., exhibited lesions of disease in the udder; 12·33 per cent. of cows were found to be tuberculous.

Belfast District Asylum.

Dr. N. B. Graham's report for the year 1922 shows that the number of patients was 975, males 466, females 509. Discharged patients numbered 141, of whom 78 were cured. There were 74 deaths. Of these, 17·5 per cent. were due to general paralysis of the insane, 16·2 to phthisis, 14·8 to cerebral softening. As regards causation, the most potent factor was found to be a faulty heredity, the other chief causes being mental stress, critical periods, and syphilis. In only 2·6 per cent. of the admissions was alcoholic excess considered to be the principal cause of the insanity, but in 10·9 per cent. it was believed to be a contributory cause. A large increase in the accommodation for patients is in progress. Dr. Graham complains of the present state of the Lunacy Laws.

> "It is illegal to receive as 'voluntary' boarders early uncertifiable mentally afflicted patients, also certifiable harmless patients, who are willing to submit to such treatment, without certification. If the Lunacy Laws were amended to meet such conditions, the stigmata of certification, so much dreaded by patients and their relatives, would be removed; they would, therefore, be advised and encouraged to submit to such treatment, and so facilitate early recovery."

The Government of Northern Ireland may be expected shortly to deal with this important matter. It is a feature of the asylum, which is situated in a spacious park some miles from the city, to encourage work amongst the patients. About 60 per cent. of the patients are regularly employed, many of them in agricultural work, and this is found to be very beneficial. The asylum is on the villa system which has proved most satisfactory.

Tuberculosis in Belfast.

The annual report of Dr. A. Trimble, chief tuberculosis officer, shows that the death-rate from pulmonary tuberculosis for the year 1922 was 1·5 per 1000. This represents a reduction of 45 per cent. as compared with the year 1918, and a reduction of 68 per cent. as compared with the year 1890. A similar fall occurred in the death-rate from non-pulmonary forms of tuberculosis. The influence of housing is shown by the fact that in 62 per cent. of the new cases examined the conditions were reported as under average. The analysis of occupations shows the relatively large number of cases occurring in clerks, engineers, spinners, stitchers, reelers, winders, doffers, labourers. Discharged soldiers showed a high proportion. It is noteworthy in view of the staple trade of Belfast that flax-dressers and other branches of the trade showed a moderate ratio amongst males and a rather high ratio amongst females. The female rate in general continues to show a considerable excess over the male rate. In 42 per cent. of cases the patients were found to have had personal association with infected persons. The rate amongst new patients varied in the different wards of the city from 5·6 per 1000 of the population to 1·5 per 1000. The proportion of pulmonary, as compared with non-pulmonary cases, was 75 to 25. The open-air school for children living in contact with tuberculous cases has been attended with great success. Sanatorium, dispensary, and domiciliary treatment is pursued.

Public Health Services.

MENTAL HOSPITALS SERVICE.

NINE recently published reports of county and borough asylums[1] offer examples of certain changes which are slowly becoming general. The removal of adverse conditions produced by the war is evidenced by an improved state of general health in the patients and lower death-rates—in particular, deaths from tuberculosis and the numbers of active cases of this disease are both fortunately diminishing. Dysentery also appears to be less common, and several outbreaks of enteric fever recorded appear to have been traced promptly to their source and kept within very narrow limits. The improvement in the patients' health is attributable in part to a more liberal diet. Dinner appears to be a universally satisfactory meal, but the all too familiar and oft-repeated suggestion in the commissioner's report that breakfast and tea should be made less monotonous is still to be found in most of these publications.

Another change, exhibited in greatly varying degree, is a response to the demand for efficient medical treatment in cases of insanity. Visiting dentists are now almost universal, although in some cases their hours of attendance can only allow of treating the most flagrant cases of dental sepsis among the patients. Surgeons and other consultants have been appointed in some cases, and at Hill End (Hertfordshire) an operating theatre has been built, and at Nottingham a pathological laboratory.

The constitution of mental hospital staffs is not apparently sharing in the general trend of progress towards greater efficiency. The junior posts in this service remain ill-paid, and open only to bachelors, and the proportion of physicians to patients remains in many cases undesirably low. At Barming Heath (Kent), for example, the post of second assistant medical officer is again vacant, as recorded in last year's report. At Chichester the post of third assistant medical officer is not only vacant, but intended by the committee to remain so indefinitely, one result of which, as pointed out by the commissioner, is that bacteriological and other laboratory work is at a complete standstill, and a well-equipped laboratory is unused. The most astonishing example of this policy (for it appears to represent an actual policy of staff reduction in some cases) is to be found at Carmarthen. Here the second assistant medical officer has had notice to terminate his services, and an institution containing nearly 600 patients is in future to be administered by the medical superintendent and one other medical officer. At the same time the number of nurses has been reduced, and their hours of service increased to 66 per week. To quote the commissioner's report :—

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[1] Annual Reports of the Brighton County Borough Mental Hospital, of the Kent County Mental Hospitals, of the Hertfordshire County Mental Hospital, of the Nottingham City Asylum, of the Monmouthshire Asylum, of the Joint Counties Mental Hospital, Carmarthen, of the West Sussex County Mental Hospital, of the Asylums Committee, City of Birmingham, and of the Down District Lunatic Asylum, Downpatrick.

> "How all the work is to be efficiently carried out, not forgetting the lectures for the nursing staff, and due relaxation is to be afforded it is difficult to see. I trust the question will be reconsidered, and that the committee may feel their way to abandoning this step, as well as the reduction of the nursing staff by 14 (and that contrary as it appears to the advice of the medical superintendent) at a time when so much is being said as to the necessity for, if possible, more systematic and individal treatment in mental disease. As to the reduction of the nursing staff, I will only point out that during my inspection to-day I noticed one female ward, number 5, with 27 chronic, noisy, troublesome cases, with but one nurse, the result, I was informed, of the reduction which has already taken place."

The only reference to these remarks in the report of the committee of visitors is a formal record of the visit, the authors of which have the effrontery to declare that the commissioner "reported that all the patients appeared to be in receipt of due supervision and care." The purpose of this painful euphemism is difficult to discern.

Nottingham and Hertfordshire have given leave of absence on trial to a number of cases, in some of which money allowances were made. The neglect of this procedure receives comment in other reports, notably in that of Carmarthen, where apparently no patients whatever were given such leave.

Chichester records a wonderfully low death-rate, of only 2·38 per cent. A small outbreak of enteric fever evokes comment on the methods of handling foul linen, which apparently "differ somewhat on the male and female sides." An interesting after-comment on the Committee of Inquiry into the Administration of Public Mental Hospitals is to be found in a paragraph referring to a late patient at Chichester who gave evidence at that inquiry: "A letter has recently been received from the ex-patient himself, retracting his allegations and apologising for the statements, which, he says, were made owing to a morbid mental state." It is unfortunate that this letter cannot be given wider publicity.

The reports of the Downpatrick and Birmingham asylums are of unusual interest, both for the readable material and full information which they provide, and the former particularly for its numerous photographic illustrations. Great changes have taken place at Birmingham. Rubery Hill and Hollymoor, until recently leased by the Ministry of Pensions, have been taken over again, and "no less than 810 patients have been transferred from institutions situated outside the city as far apart as York and Hampshire without accident." Great improvements have been made in the buildings, and their equipment now includes clinical laboratories, examination rooms, operating and dental room, hydrotherapeutic room, and research laboratories. These were referred to in reporting the inaugural ceremony of the Joint Board of Research in Mental Disease. A bridge which will shortly be complete will unite the Rubery and Hollymoor estates, and "provide about three miles of varied exercise track, with rustic seats in certain wooded spots." Perhaps the most arresting feature of this report is an exhaustive analysis, on original and up-to-date lines, of the ætiological factors assigned in the 147 direct admissions of the year. These observations deserve wider publicity.

One or two of the reports under review yield practically no information whatever beyond what can be found in their statistical tables. It still appears to be incumbent on some medical superintendents to record the condition of crops and cattle, and repairs to boilers or drains. Admittedly the state of the fabric of an asylum, and every sort of function performed by everyone connected with it, have some bearing on the patients' welfare, and should be under the medical superintendent's control, but why he should be called upon to describe such activities as these rather than discuss the mental welfare of his patients in a report which in any case is usually all too brief is difficult to understand.

SCHOOL MEDICAL SERVICE.

Hertfordshire.

The number of children inspected was 13,509, and the percentage with defects 32·1. Enlarged tonsils accounted for 5·8 per cent., enlargement of submaxillary and cervical glands 3·8 per cent., and malnutrition 1·3 per cent. Schools were closed on 181 occasions compared with 46 closures in 1921, the increase being due to influenza, colds, and measles. The four orthopædic centres of the Herts branch of the British Red Cross Society which were organised by Mr. R. C. Elmslie, orthopædic consultant to the London County Council, have been in full working order for one year, and the results obtained have been very satisfactory. Dr. Hyslop Thompson reports that the centres have supplied a long-felt want in the county, and the improvement in many cases is very marked. The following are the cases dealt with :—

—	Males.			Females.		
	Under 5 years.	Under 14 years.	Over 14 years.	Under 5 years.	Under 14 years.	Over 14 years.
Paralysis	9	18	3	6	12	3
Bone defects ..	14	7	1	15	9	1
Spinal curvatures	0	9	1	0	15	8
Joints	0	2	1	3	0	4
Injuries	0	5	10	1	4	8
Miscellaneous ..	6	12	6	8	13	14
Totals	29	53	22	33	53	38
Both sexes ..	62	106	60	—	—	—

Norfolk.

During the year 13,698 children were examined in the routine groups. In addition, 2111 special inspections were made and 8427 children were re-examined. About 1 per cent. suffered from malnutrition, and Dr. J. T. C. Nash refers the decline in the number of these cases as being eloquent of the better conditions for farm labourers prevailing during the past few years, but is dubious of the improvement being maintained owing to the recent fall in wages. Cleanliness has improved with the exception of certain families which will always be "impossible." Refraction clinics were held at 97 centres and four dental vans equipped for inspection and treatment are employed by four dentists, 78 per cent. of the 18,270 children seen being referred for treatment, and about one-third of these taking advantage of the authority's scheme. There were 2305 school children excluded from school under Article 45(B) for infectious disease, 148 of these for influenza.

Forty-seven children received institutional treatment for definite or suspected tuberculosis, seven of these being of the non-pulmonary type. In addition 79 children were under domiciliary treatment. At the end of the year there were 28 cases still in institutions and 75 under domiciliary treatment. Dr. Nash is of opinion that, although sanatorium treatment is expensive, money is well spent in preventing the onset of definite clinical tuberculosis, and he considers that the nearer schools approach the open-air type the better, and suggests that less money might be spent on bricks and mortar and more on asphalted playgrounds, clothing, and food. "At the present time children, often poorly fed and inappropriately clothed, with defective footwear, have to sit for the best part of two hours in winter with cold, wet feet in rooms at a temperature under 50° F. in many schools. Is it to be wondered at that catarrh is common and that the children are too miserable to benefit fully from the instruction?"

One of the school dentists, Mr. Millican, contributes an interesting report on jaw deformities. He finds that children born and living on high sites or on the sea-front are freer from jaw or palatal deformity than children on low and damp sites, and he places the "locality" as the chief determining cause of jaw deformity.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

Surg. Comdrs. R. H. St. B. E. Hughes to *Excellent*; F. G. H. R. Black to *Pembroke*, addl., for Chatham Dockyard, temp. Surg. Lt.-Comdrs. W. H. Sinclair-Loutit, R. Buddle, P. N. Button, W. J. Morris, J. F. Pace, J. F. M. Campbell, M. B. Macleod, and G. W. Woodhouse to *President*, addl., for five months' course of instruction at R.N. College, Greenwich. F. C. Wright to *Pembroke*, for Chatham Dockyard; and G. L. Ritchie to *Impregnable*. Surg.-Lt. R. W. Higgins to *Queen Elizabeth*.

ROYAL NAVAL VOLUNTEER RESERVE.

The following late Temp. Dental Surgs. have been transerred to the permanent list as Surg.-Lts.: T. P. Cooper, G. W. E. Holloway, A. G. D. Pridham, D. C. Lamond, E. G. Parkinson, G. R. D. Hankinson, and A. C. Bloomer.

ROYAL ARMY MEDICAL CORPS.

The undermentioned Cols., late R.A.M.C., retire on ret. pay: J. B. Anderson, on account of ill-health contracted on active service; R. J. Blackham from half pay.

The undermentioned Capts. are seconded for service with he Egyptian Army: D. C. Bowie, J. C. Collins, and J. J. Magner.

Temp. Capt. N. Leonard relinquishes his commission and etains the rank of Capt.

TERRITORIAL ARMY.

Capts. W. M. Wilson and E. W. Herrington having ttained the age limit are retd. and retain the rank of Capt.

Lt. (Temp. Capt.) F. J. Cleminson relinquishes his commission and is granted the rank of Capt.

Capt. N. M. Fergusson to be Maj.

S. McC. Kirk to be Lt.

General Hospitals: Lt.-Col. Sir E. J. Maclean having ttained the age limit is retd. and retains the rank of Lt.-ol.

The undermentioned relinquish their commissions and etain their rank, except where otherwise stated: Majs. . C. Bevers and F. C. Pybus; Capts. H. M. Clarke, P. H. reen (granted the rank of Maj.), and J. A. Gunn.

Sanitary Companies: Capt. H. Duguid relinquishes his ommission and retains the rank of Capt.

INDIAN MEDICAL SERVICE.

Majs. E. C. Hodgson, W. Gillitt, C. H. Barber, W. Tarr, . Watts, I. D. Jones, W. T. Finlayson, W. T. McCowen, . E. Stanger-Leathes, J. M. Holmes, and M. F. White to e Lt.-Cols.

The King has approved the admission of the fol-wing: J. H. Barrett, G. H. Fraser, and T. H. Thomas be Capts.

Messrs. William Heinemann (Medical Books), Ltd. nnounce the early appearance of "High Blood Pressure: its ariations and Control," by Dr. J. F. Halls Dally; Pneumonia," by the late Dr. Robert Murray Leslie, edited, vised, and brought up to date by Dr. J. Browning exander; and "Manual of Practical X Ray Work," ird edition, by Dr. John Muir, B.Sc., in collaboration th Sir Archibald Douglas Reid.

Correspondence.

"Audi alteram partem."

BLOOD-DONORS.

To the Editor of THE LANCET.

SIR,—On the evening of Sept. 3rd a broadcast appeal for volunteers to act as blood-donors was sent out from King's College Hospital. The response was generous, the group-tests were done on the 4th, one suitable donor was selected, and the operation of transfusion arranged for the 5th. There the affair ends as far as the public is concerned. Expert criticism is disarmed by the statement that "the others have been classified for possible future emergencies."

One cannot help wondering how many of our hospitals find themselves in a similar state of unreadiness as regards blood-donors; nor can the reflection be avoided that in the majority this defect of organisation could be easily remedied. About six months ago, having need of a donor to give blood to a case of hæmatemesis (from gastric ulcer) I was fortunate enough to find at hand a known No. 4 volunteer; the transfusion was done at once, and the patient recovered. Realising that fortune is a fickle jade, I determined to make provision against a similar emergency, and to that end asked for volunteers amongst the employees of the Great Western Works, who number nearly 15,000, at Swindon. The response was generous; Dr. Knyvett Gordon came down and tested about 50 volunteers during one afternoon. At some convenient time in the near future another batch will be tested, but already, secure in the knowledge that at least a dozen No. 4 donors, of good physique and sound constitution are available at any moment, I have no anxiety now on this matter.

On two occasions since then I have been glad that this organisation existed, but the real criterion came on July 24th last when a man, aged 52, was struck by the flying fragment of a broken cutting tool in the left groin at the G.W.R. Works. Arterial blood cascaded from the deep wound inflicted. Two of his fellow workmen, trained in ambulance work, with commendable promptitude and efficiency controlled the femoral at the brim of the pelvis for 20 minutes, during which time, on an improvised operating table, and under ether, I was able to tie the external iliac artery. That being safely accomplished I enlarged the wound and tied the proximal and distal ends of the femoral and the severed profunda femoris. So far the account is not of special interest, and the replica could be furnished from hundreds of large works and hospitals. But as the last dressing was applied a workman approached me and asked, "Are you needing a No. 4 donor, because if you are, there is one ready waiting."

It is true that a large works offers ideal facilities, but there should be no insuperable difficulties in the way of applying the principle with varying degrees of perfection according to the conditions obtaining throughout the country. The factor of expense cannot be neglected. It is essential that the tests be made by a pathologist of experience; at the same time a Wassermann test can be done, and an adequate physical examination carried out. Every volunteer should receive a card stating his blood-group, and a record should be kept at the hospital of his address, &c. If the investigation be made of "batches" the expense is trifling. It is remotely possible that the Ministry of Health may consider the project worthy of consideration.

I am aware that efficient provision has been made for this contingency at certain hospitals; I have in mind, however, the organised registration of donors drawn from large works or other more or less stable communities. I am, Sir, yours faithfully,

H. H. GREENWOOD, B.S. Lond., F.R.C.S. Eng.,
Consulting Surgeon, G.W.R. Hospital; Hon. Surgeon,
Victoria Hospital, Swindon.

Sept. 7th, 1923.

A MEDICAL AND NURSING SERVICE IN RURAL MANITOBA.

To the Editor of THE LANCET.

SIR,—I think your readers will be interested in a brief account of a combined medical and nursing service organised for rural areas by the Manitoba Division of the Canadian Red Cross Society, especially as it has been of tremendous assistance to many British-born settlers whose wives in many cases have come directly from the Old Land to live in what are known as the unorganised areas of Manitoba. It illustrates also the value of the whole-hearted coöperation of the medical profession with the Red Cross peace-time service.

In 1919 the Red Cross Society, finding a great and urgent demand for some sort of skilled assistance in dealing with the health of certain districts which had no other civilised social service, established at Reynolds, where Poles and Ruthenian settlers abound, 63 miles east of Winnipeg, Fisher Branch, 72 miles N.W. and Grahamdale, 134 miles N.W. (both points lying between Lakes Winnipeg and Manitoba), and also at Kinosota, 140 miles N.W., on the west side of Lake Manitoba, nursing stations, which were at first disciplined and managed by the Provincial Board of Health but now are under the exclusive management of the Red Cross Society with its Medical Advisory Board. These nursing stations proved of great value, but it soon became apparent that medical supervision was needed and that too great a responsibility was being placed on nurses whose calling does not include the ability to diagnose and to decide the final destination of any given case. It must be remembered that these districts, except Reynolds, were 40 miles at least from the nearest doctor and that very few of the people could afford to pay any fees. The problem was how to cover the ground effectively. For most of the year the roads are only passable by foot or horse-drawn vehicles, and not always thus. Bush country in unorganised Manitoba is always very boggy in spring and often in summer; in winter snow may block the trails. At the request of the Red Cross Society the Winnipeg Medical Society appointed an advisory committee of five doctors who had had a wide experience of rural conditions in Manitoba, under the chairmanship of one of the leading surgeons. After examining such propositions as the organisation of a travelling hospital the medical committee declared itself in favour of appointing a medical officer to the Unorganised Areas Service, who should be paid an ample salary with free transport, give full-time service without other remuneration, and make Winnipeg his headquarters, whence he should visit in turn or as occasion demands these or other nursing stations established by the Red Cross Service. This recommendation was adopted and financed entirely by the Red Cross Society, with the exception that the Winnipeg Medical Society presented the service with the necessary outfit of instruments for midwifery as well as for medical and surgical purposes. Since the fall of 1920 a succession of well-trained young medical men have manned this service to the great comfort and support of the nurses and to the relief of hundreds of settlers and their families.

Here I would like to emphasise the splendid services of our nurses, many of whom have been trained in the Old Country and have proved the value of their training for the C.M.B. diploma when handling the inevitable midwifery perforce single-handed and under difficult conditions. As an eloquent sample of the appreciation of this service to unorganised areas the following is a quotation from a recent letter to the present writer:—

> "The Red Cross people have done a great work here. It is so comforting to us to have the nurse near us and the doctor's monthly visits. This spring the trails have been awful; the land is too wet to seed and now the meadows are too wet to cut the hay. Our post office is 3½ miles away but we have to go about seven miles to get there! Nurse has done fine work since she came here; has visited hundreds in all kinds of weather by land and lake; has been caught in storms and tumbled into snow-drifts, stuck in sloughs, and got lost on several occasions in happy ignorance of the danger! Few nurses would have gone through it, cold and hungry many a time, and no complaints, night and day. In fact she has had as many escapades as St. Paul!"

This is not exaggerated, and refers, of course, only to the unorganised parts of Manitoba. My committee consists of Dr. Jasper Halpenny (chairman), Drs. N. W. Warner, G. S. Fahrni, T. C. Brereton, and myself.—I am, Sir, yours faithfully,

H. M. SPEECHLY, M.R.C.S. Eng.,
Hon. Secretary, Medical Advisory Committee.

Winnipeg, August 22nd, 1923.

PATHOLOGICAL DEPARTMENTS.

To the Editor of THE LANCET.

SIR,—On this subject communications appeared last week in THE LANCET which call for comment.

The utilisation of university pathological departments for money-making may bring them into competition with the pathological departments of county hospitals in an unfair manner. This hospital, for instance, has a fully equipped pathological and bacteriological department with a specialist in charge, who is only allowed to practise as such and whose livelihood depends on this practice. There is a V.D. clinic in the hospital, a few yards from the laboratories, but bloods for Wassermanns *must* be sent to a distant university. The Ministry of Health refuses to allow the county council to pay the hospital department for Wassermann tests in spite of the representations of the county M.O.H., the County Public Health Committee, the clinic medical officers, and the medical and surgical staff of the hospital. The result is that the clinic bloods are "split" and with the hospital bloods (not "split") are done weekly as a matter of routine by the pathologist, who though unpaid, is not without honour in his own laboratory when reports differ. "Seeing the wheels go round" is preferred to a five-shillings-in-the-slot postal machine delivering a piece of pasteboard!

The position is the same in an adjoining county, and will no doubt be the same in a third county which is considering the appointment of a county pathologist.—I am, Sir, yours faithfully,

Salisbury, Sept. 10th, 1923. H. ST. ARNAUD AGATE.

DEFATTED BACTERIAL VACCINES.

To the Editor of THE LANCET.

SIR,—In a lecture delivered on June 14th at St. Mary's Hospital, Prof. G. Dreyer claimed to have made an important discovery by using defatted tubercle bacilli as antigen for diagnostic and therapeutic purposes in tuberculosis. This work has been enthusiastically received by the whole press, and may arouse hopes that will not be satisfied. The Institute of Microbiology in Saarbrücken has been working on very similar lines for years and the use of defatted tubercle bacilli has proved a delicate matter. I should therefore be very much obliged if you will allow me to indicate two things that will lead to a sober valuation of Prof. Dreyer's investigations.

In 1921 [1] and 1922 [2] I published experiments that demonstrated the necessity of defatting tubercle bacilli before using them as specific antigen. I described then a special method of defatting tubercle bacilli by means of the vapours of ether or other fat-dissolving liquid, and was able to show that in this process the biologic albumin of the bacilli remains intact and unaltered. The defatted tubercle bacill form a stable emulsion that is specifically precipitated by the serum of tuberculous persons and this so-called "tuberculo-diagnosticum" is already in constan use at many sanatoria and by medical officers to schools. The same emulsion gave complemen deviation when brought in contact with serum from tuberculous persons and showed remarkable effect when used as anti-tuberculous vaccine in men.[3] These facts have been fully confirmed by Wassermann,[4] who used another process of defatting the tubercle bacilli. Of the earlier publications recommending defatted tubercle bacillus as specific antigen, Prof. Dreyer's observations appear to be a confirmation.

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[1] Annales de l'Institut Pasteur, xxxv., 797.

[2] Deutsche Archiv für klinische Medizin, cxxxviii., 229.

The second and more remarkable point in Prof. Dreyer's lecture is the fact that his tuberculous antigen withstands exposure for four hours and more to 100° C., at which temperature tubercle bacilli must, according to him, be boiled with formalin and acetone if they are to lose their acid resistance.[5] Up-till now bacteriologists have always carefully tried to avoid as much as possible any alteration of the antigen contained in the living microbe, the immunising power of which is demonstrated to us daily by practical experience. That Prof. Dreyer's boiled tuberculous antigen still possesses the same immunising power is a real discovery of highest theoretical importance, unless further investigation should prove that his good results are due rather to the effect of a protein than of a real immune-therapy.

I am, Sir, yours faithfully,

Saarbrücken, Sept. 4th, 1923. W. FORNET.

Medical News.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION.—A fortnight's "Refresher" Course in general medicine and surgery will be given at the London Temperance Hospital in conjunction with Bethlem Royal Hospital, North-Western Fever Hospital, and the Royal Westminster Ophthalmic Hospital from Oct. 8th to 20th. The course will include daily lectures and clinical demonstrations in the wards and out-patient department. A course on genito-urinary diseases will be given at St. Peter's Hospital from Oct. 1st to 27th. In addition to demonstrations in the out-patient department a series of lectures will be given on various aspects by the members of the staff. A course of eight lectures on tropical diseases will be given by Dr. G. Low and Dr. P. Manson-Bahr at the School of Tropical Medicine, beginning on Tuesday, Oct. 2nd. The subjects considered will be the more important diseases of tropical countries. A course in laryngology, rhinology, and otology, consisting of clinical demonstrations, lectures, &c., each day from 9.30 A.M. to 5 P.M., will be given at the Central London Throat, Nose, and Ear Hospital from Oct. 8th to 26th. A further course on children's diseases will be given at the Victoria Hospital for Children from Oct. 8th to 20th, and in ophthalmology at the Royal London Ophthalmic Hospital from Oct. 8th to Nov. 3rd. The National Hospital for Diseases of the Heart and St. Mark's Hospital for Diseases of the Rectum will each give a fortnight's course on cardiology and proctology respectively, from Oct. 15th to 27th. Copies of the syllabus and further particulars regarding any of the above courses will be forwarded on application to the secretary to the Fellowship of Medicine at 1, Wimpole-street, London, W. 1.

LEBANON HOSPITAL.—Great Britain, America, Holland, and Switzerland all share in the work of the Lebanon Hospital for Mental Diseases, Asfuriyeh, Beyrout, Syria, and the report for the twelvemonth ended March 31st, 1923, shows that the institution has accomplished much good work. During the year under notice there were 279 patients under treatment including 181 new patients, of whom 132 were men and 49 women. Dr. H. Watson Smith, the medical director, states that the increase in the number of women patients necessitated the squeezing in of additional beds in the American and Philadelphia pavilions to accommodate them, and so resulted in an unavoidable congested condition of these houses. The opening of the Strawbridge Memorial House for women patients fortunately relieved this state of affairs. The general statistics show that 38 men and 18 women recovered, and that 49 men and 5 women benefited by their stay in the hospital, while 26 men and women left the hospital for various reasons. The needs of the institution include a permanent and adequate water-supply at an estimated cost of £1000, an X ray plant at £500, a laundry at £1000, and a septic tank at £100. The address of the general secretary is at the Lebanon Hospital Office, 35, Queen Victoria-street, London, E.C.4.

ROYAL DENTAL HOSPITAL OF LONDON.—The prize distribution of the London School of Dental Surgery will take place at the hospital on Oct. 1st at 5 P.M., when Dr. Christopher Addison will distribute the prizes.

SMALL-POX IN ENGLAND AND WALES.—In the week ended Sept. 1st 21 cases of small-pox were reported in England and Wales, ten of these being from Gloucester. Three cases were reported in London on Sept. 7th, one each from Paddington, Finsbury, and Camberwell respectively, and in the five days following five further cases and two suspects came to light. The Camberwell patient was employed at a London hotel, and two cases in Westminster and Lewisham have been attributed to the same source. Infection in the others has been traced to a visitor recently arrived from Spain, whose indisposition was not recognised until the maid who attended her was found to be suffering from small-pox.

THE LATE DR. CLARENCE ROBINSON.—Dr. Robinson, who died suddenly at the early age of 42 on August 29th while on holiday in the Isle of Man, was a popular practitioner in Warrington. A native of Cork, he qualified L.R.C.P. & S. Irel. from Queen's College in 1903 and was appointed house surgeon at the General Hospital, Ramsgate, afterwards becoming visiting surgeon to the Ramsgate and St. Lawrence Dispensary. He went into partnership in general practice at Camberwell Green, and about 15 years ago migrated to Latchford, Warrington, where he became surgeon to the Warrington Infirmary, a member of the panel committee, and surgeon to the pensions board. In the early days of the war he worked at the Lord Derby War Hospital at Winwick, and afterwards served for five years at Thelwall Heys. He leaves a wife and two sons.

Medical Diary.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE, SPECIAL COURSE IN INFANTS' DISEASES, at the Infants Hospital, Vincent-square, Westminster, S.W.

MONDAY, Sept. 17th.—2–3.30 P.M., Dr. William Robinson: Congenital Heart. 4.30–6 P.M., Dr. Eric Pritchard: Premature Infants, Management and Feeding.

TUESDAY.—2–3.30 P.M., Dr. Eric Pritchard: Syphilis in Infants. 4.30–6 P.M., Mr. Philip Franklin: Tonsils and Adenoids. Demonstration and Operation

WEDNESDAY.—2.30–3.30 P.M., Dr. Helen Mackay: Special Cases in Wards and Out-patient Department (Diabetes and Insulin Treatment, Mongolism, Malaria, Enlarged Thymus, &c.). 4–6.30 P.M., Dr. Donald Paterson: Lecture: Encephalitis and Poliomyelitis.

THURSDAY.—2–3.30 P.M., Dr. Donald Paterson: Special Cases (Wind Swallowing). 4.30–6 P.M., Mr. M. S. Mayou: Lecture and Demonstration: Some Common Eye Conditions from the Practitioner's Point of View.

FRIDAY.—2–3.30 P.M., Dr. Eric Pritchard: Round Table Consultation. Special Cases for Diagnosis. 4.30–6 P.M., Dr. Donald Paterson: Summer Diarrhœa.

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith-road, W.

MONDAY, Sept. 17th.—10 A.M., Mr. Maingot: Surgical Pathology. 12 noon, Mr. Simmonds: Applied Anatomy. 2.30 P.M., Dr. Saunders: Medical Wards.

TUESDAY.—12 noon, Dr. Burrell: Chest Cases. 2 P.M., Mr. Banks-Davis: Throat, Nose, and Ear Department. 2.30 P.M., Dr. Pritchard: Medical Wards.

WEDNESDAY.—10 A.M., Dr. Saunders: Medical Diseases of Children. 2 P.M., Dr. Burnford: Medical Wards. 3 P.M., Dr. Pernet: Skin Department.

THURSDAY.—10 A.M., Dr. Grainger Stewart: Neurological Department. 12 noon, Mr. Simmonds: Demonstration of Fractures. 2 P.M., Mr. Bishop Harman: Eye Department.

FRIDAY.—10 A.M., Mr. Dudley Buxton: Dental Department. 2 P.M., Dr. Burrell: Medical Out-patients. 2 P.M., Mr. Sinclair: Surgical Out-patients.

SATURDAY.—9.30 A.M., Dr. Burnford: Bacterial Therapy. 10 A.M., Dr. Saunders: Medical Diseases of Children. 10 A.M., Mr. Banks-Davis: Operations on Throat, Nose, and Ear.

Daily, 10 A.M. to 6 P.M., Saturdays 10 A.M. to 1 P.M., In-patients, Out-patients, Operations, Special Departments.

Appointments.

PANTING, L. C., M.D., B.Ch. Oxf., M.R.C.P. Lond., F.R.C.S. Eng., has been appointed Honorary Consulting Surgeon to the Helston and District Cottage Hospital.

ROBERTS, C., M.B., B.S. Lond., F.R.C.S. Eng., one of the Medical Referees under the Workmen's Compensation Act for County Court Circuits No. 5 and 8.

Certifying Surgeons under the Factory and Workshop Acts:
MACKAY, W. M., M.B., Ch.B. Edin. (Crook, Co. Durham);
FOXTON, H., M.B., Ch.B. Leeds (Uttoxeter).

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[3] Münchener Medizin. Wochenschr., May 11th, 1923.
[4] Deutsche Medizin. Wochenschr., March 9th, 1923.
[5] Brit. Jour. of Exp. Pathology, June, 1923, iv., 146.

Vacancies.

For further information refer to the advertisement columns.

Aberystwyth Infirmary, &c.—H.S. £200.
Aylesbury, Royal Bucks Hospital.—R.M.O. £200.
Barbados Parish of St. Andrews.—M.O. £300.
Benenden (Kent) National Sanatorium.—Res. Asst. M.O. £250.
Bradford Royal Infirmary.—H.S. £150.
Central London Ophthalmic Hospital, St. Pancras, W.C.—H.S. £100. Jun. H.S. £50. Also X Ray O.
Dover Royal Victoria Hospital.—H.S. £180.
Dreadnought Hospital, Greenwich.—H.S. and H.P. Each £150.
East African Medical Service.—M.O. £600.
Hackney Metropolitan Borough.—M.O. for Infant Welfare Centre.
Ipswich County Borough.—Sen. Asst. M.O.H., &c. £600.
London County Mental Hospital Service.—Seventh Asst. M.O. £432.
London Jewish Hospital, Stepney Green, E.—Hon. Asst. P., Hon. S. Also Asst. to Out-Patients. £100.
Manchester, Ancoats Hospital.—Res. M.O. £200. Med. Reg. £100.
Manchester Royal Hospital, Salford.—R.M.O. £200. Two H.S.'s and Cas. H.S. Each £150.
Manchester, Royal Infirmary.—Surgical Tutor. £30.
Middlesex Hospital, W.—Radium O. £300.
Mount Vernon Hospital for Diseases of the Chest, Northwood, Middlesex.—Asst. P.
Newcastle-on-Tyne Dispensary.—Hon. Phys.
Nottingham City Education Committee.—Jun. Asst. Med. Insp.
Prince of Wales's General Hospital, Tottenham, N.—H.S. £150. H.P. £150. Also J.H.S. and J.H.P. £110 each.
Queen's Hospital for Children, Hackney-road, E.—H.P. and Cas. H.S. £100.
Royal National Orthopœdic Hospital, 234, Great Portland-street, W.—H.S. £150.
Royal Naval Medical Service.—Surgeon-Lieutenants.
Saint Pancras Dispensary, 39, Oakley-square, N.W.—Hon. S.
Walsall County Borough.—Asst. M.O.H. £650.
West African Medical Service.—M.O. £660.
West Bromwich and District Hospital.—Res. Asst. H.S. £180.
Wolverhampton and Staffordshire Hospital.—Res. M.O. £150.

Births, Marriages, and Deaths.

BIRTHS.

BURTON.—On Sept. 8th, to the wife of A. H. G. Burton, M.D., of 13, Beaufort-gardens, Ilford—a daughter.

GRAHAM-STEWART.—On Sept. 4th, at Northdown-avenue, Cliftonville, Margate, the wife of A. Graham-Stewart, M.B., Ch.B., of a son.

HUGHES.—On Sept. 6th, at Heylands, Chagford, Devon, the wife of Dr. H. Ll. Glyn Hughes, D.S.O., M.C., of a daughter.

STOKES.—On Sept. 4th, at Restholme, Cantelupe-road, Bexhill-on-Sea, the wife of Dr. Kenneth Stokes, of a daughter.

WARRICK.—On Sept. 1st, at Blackheath, the wife of R. W. Warrick, M.B., B.S., of a son.

MARRIAGES.

BAXTER—STOPS.—On Sept. 5th, at Emmanuel Church, Didsbury, Manchester, Stephen Edw. Baxter, M.R.C.S., L.R.C.P., to Ruth Jessica, second daughter of the late T. S. Stops, J.P., of Tiffield, Towcester, Northants.

BLAIR—HENDERSON.—On Sept. 5th, at St. Cuthbert's Church, Colinton, Edinburgh, R. G. Blair, M.C., M.B., to Nicolina Margaret, daughter of W. R. Henderson, of Chisholme, Roxburghshire, and Menld, Oxton, Cheshire, and Mrs. Henderson.

BROWNE—BOTT.—At Grange-in-Borrowdale, on Sept. 5th, Leonard Foster Browne, M.D., of 9, Harley-street, W., to Violet, fourth daughter of the Rev. Richard Bott, of Cotehill, near Carlisle.

MCCAUSLAND—SIMSON.—On Sept. 10th, in London, by special licence, Dr. Albert McCausland, of Swanage, to Miss Mildred Spicer Simson.

MCNEE—LE BAS.—On Sept. 4th, at the Chapel of the Charterhouse, London, John W. McNee, D.S.O., M.D., to Geraldine Z. L. Le Bas, only child of the late Cecil H. A. Le Bas and of Mrs. Le Bas, 20, Ridgmount-gardens, London.

ROBERTSON—BLACK.—On Sept. 1st, at Holy Trinity Church, Skirbeck, Boston, Dawson Cameron, M.B., Ch.B., to Ethel Freda Ogle, only daughter of Mr. and Mrs. Arthur Black, Burton House, Boston.

TRAVERS SMITH—IEVERS.—On August 4th, in London, Richard Travers Smith, M.D., F.R.C.P.I., of 17, Harcourt House, Cavendish-square, W. 1, to Ernesta Carlotta Nina, widow of James Butler Ievers, of Quinville Abbey, Quin, Co. Clare, younger daughter of the late Surgeon-General George Whitla, of The Drive, Hove, and Mrs. Whitla.

DEATHS.

HARTRIDGE.—On Sept. 8th, at Wimpole-street, W. 1, Gustavus Hartridge, F.R.C.S., aged 73 years.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Comments, and Abstracts.

SOME BEARINGS OF ZOOLOGY ON HUMAN WELFARE.*

BY PROF. J. H. ASHWORTH, F.R.S.

THE bearings of zoology on human welfare—as illustrated by the relation of insects, protozoa, and helminths to the spread or causation of disease in man—have become increasingly evident in these later years.

Arthropods as Carriers of Disease.

At the time of the last meeting of the British Association in Liverpool, held in the year 1896, insects were suspected of acting as transmitters of certain pathogenic organisms to man, but these cases were few and in no single instance had the life cycle of the organism been worked out and the mode of its transmission from insect to man ascertained. Sir Patrick Manson, working in Amoy, had shown (1878) that the larvæ of *Filaria bancrofti* undergo growth and metamorphosis in mosquitoes, but the mode of transference of the metamorphosed larvæ was not determined until 1900. Nearly two years after our last meeting here the part played by the mosquito as host and transmitter of the parasite of malaria was made known by Ross. In addition to these two cases at least eight important examples can now be cited of arthropods proved to act as carriers of pathogenic organisms to man—e.g., Stegomyia—yellow fever, Phlebotomus—sandfly fever, tsetse-flies—sleeping sickness, Conorhinus—South American trypanosomiasis (Chagas's disease), Chrysops—*Filaria (Loa) loa*, the flea *Xenopsylla cheopis*—plague, the body louse—trench fever, relapsing fever, and typhus, and the tick Ornithodorus—African relapsing fever. In selecting examples for brief consideration I propose to deal very shortly with malaria, although it is the most important of the insect-carried diseases, because the essential relations between the Anopheles mosquito and the parasite are known to everyone here. There still remain lacunæ in our knowledge of the malarial organisms. Ross and Thomson (1910), working in this city, showed that asexual forms of the parasite tend to persist in small numbers between relapses, and suggested that infection is maintained by these asexual stages. Such explanation elucidates those cases in which relapses occur after short intervals, but the recurrence of the attacks of fever after long intervals can only be explained by assuming that the parasites lie dormant in the body—and we know neither in what part of the body nor in what stage or condition they persist. Nevertheless, the cardinal points about the organism are established, and preventive measures and methods of attack based on a knowledge of the habits and bionomics of Anopheles have been fruitful in beneficial results in many parts of the world.

Knowledge of the Methods of Disease Transmission.

If we desire an illustration of the vast difference to human well-being between knowing and not knowing how a disease-germ is transmitted to man, we may turn to the case of yellow fever. When this pestilence came from the unknown, and no one knew how to check it, its appearance in a community gave rise to extreme despair and in many cases was the signal for wholesale migration of those inhabitants who could leave the place. But with the discovery that Stegomyia was the transmitting agent all this was changed. The municipality or district took steps to organise its preventive defences against a now tangible enemy, and the successful issue of these efforts, with the consequent great saving of life and reduction of human suffering in the Southern United States, in Panama, in Havana, and in other places, is common knowledge. It is a striking fact that during 1922 Central America, the West Indies, and all but one country of South America were free from yellow fever, which has ravaged these regions for nearly two centuries. The campaign against Stegomyia is resulting, as a recent Rockefeller report points out, in yellow fever being restricted to rapidly diminishing isolated areas, and this disease seems to be one which by persistent effort can be brought completely under control.

Refinements of Entomological Research.

The relation of fleas to plague provides one of the best and most recent illustrations of the necessity for careful work on the systematics and on the structure and bionomics of insects concerned in carrying pathogenic organisms. Plague was introduced into Bombay in autumn 1896, and during the next two years extended over the greater part of Bombay Presidency and was carried to distant provinces.

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* A section of the Presidential Address delivered to the Section of Zoology, British Association for the Advancement of Science, at the annual meeting in Liverpool on Sept. 13th.

The Indian Government requested that a Commission should be sent out to investigate the conditions. This Commission, which visited India in 1898–99, came to the conclusion (1901) that rats spread plague and that infection of man took place through the skin, but—and this is amazing to us at the present day—“ that suctorial insects do not come under consideration in connexion with the spread of plague.” Further observations, however, soon showed this conclusion to be erroneous. Liston found in Bombay in 1903 that the common rat-flea was *Pulex* (*Xenopsylla*) *cheopis*, that it was present in houses in which rats had died of plague and n which some of the residents had become infected, that the plague bacillus could multiply in the stomach of this lea, and that the flea would—in the absence of its usual host—attack man. These observations pointed to the mportance of this flea in the dissemination of plague, and the Second Plague Commission, which was appointed and began work in 1905, definitely proved that *Xenopsylla cheopis* is the transmitter of the plague organism from rat to rat and from rat to man. The mechanism of transmission of the plague bacillus was worked out by Bacot and Martin n 1913. Subsequent research has shown that all fleas of the genus *Xenopsylla* living on rats are not of the one species. n plague areas it was found that *X. cheopis* was the common lea, while *X. astia* was the prevalent species in those districts which had remained free from plague or had suffered only ightly.

The distinction of *X. cheopis* from *X. astia* is not an ntomological refinement with purely systematic significance, but corresponds with a different relation of the species to the pidemiology of plague, and hence becomes a factor of great practical importance. If through these researches it has become possible by examination of the rat-fleas of a locality o estimate accurately its liability to plague, anti-plague measures may henceforward be restricted to those areas in which plague is likely to occur—i.e., where *cheopis* is the redominant flea. Thus a great economy of effort and of xpenditure and a higher degree of efficiency may be chieved ; in fact, the problem of the prevention or reduction f plague may be brought from unwieldy to practicable roportions. When it is remembered that since we last met n Liverpool some 10¼ millions of people have died in India rom plague we have a more than sufficient index of the nportance of a precise knowledge of the systematics, tructure, and bionomics of the insect-carrier of *Bacillus pestis.*

Classification of Protozoa.

Another of the outstanding features of the period under review has been the extensive and intensive study of the Protozoa. The structure and the bionomics and life-history f these organisms have been investigated with the help f the finest developments of modern technique. It is fitting ere to record our acknowledgement to two staining methods —Heidenhain’s iron-hæmatoxylin and the Romanowsky ain (including Giemsa’s and Leishman’s modifications), hich have added greatly to our technical resources.

There is time to refer only to certain of the Protozoa hich directly affect man. Twenty years ago our knowledge f the few species of Protozoa recorded from the human imentary canal was defective in two important respects—he systematic characters and the biology of the species—o there was much confusion. Subsequent investigations, nd especially those of the last ten years (by Wenyon, Dobell, nd others), have cleared up most of the doubtful points, ut owing to the difficulties of size and the paucity of haracters available it is by no means easy in practice to stinguish certain of the species. Of the 17 species now nown to occur in the intestine of man *Entamœba histolytica* s received particular attention. This organism lives as a ssue parasite in the wall of the large intestine, where, as a le, the damage caused is counterbalanced by the host’s generative processes. But when the destruction outstrips e regeneration intestinal disturbance results, leading to e condition known as amœbic dysentery.

In all work with human Entamœbæ there is need for itical determination of the species, for, in addition to *histolytica*, a closely similar species, *E. coli*, is a common habitant of the intestine. This, however, is a harmless mmensal, feeding on bacteria and fragments derived from e host’s food. The distinction between the two species sts chiefly upon the characters of the nuclei and of the ature cyst—quadrinucleate in *histolytica* and octonucleate *coli*—and considerable care and technical skill are requisite many cases before a diagnosis can be given. And yet this stinction is definitely necessary in practice, for indis- minate treatment of persons with Entamœbæ is indefen- ble ; treatment is only for those with *histolytica ;* it is eless for those with *coli*, and subjects them needlessly to unpleasant experience.

A notable result of recent work is the proof that the more mmon intestinal protozoa, formerly believed to be restricted warmer countries, occur indigenously in Britain. This was st established by a group of observers in this city, and has en confirmed and extended by subsequent workers. There is good reason for believing that in this country the incidence of infection with *E. histolytica* is about 7 to 10 per cent., and with *E. coli* about five times as great (Dobell).

Mode of Entry of Parasitic Worms.

Of the problems presented by the parasitic worms the most momentous are those associated with Ankylostoma and its near relative Necator, which are prevalent in countries lying between 36° N. and 30° S.—a zone which contains more than half the population of the earth. Heavy infection with Ankylostoma or with Necator produces severe anæmia, and reduces the host’s physical and mental efficiency to a serious degree. Until 1898 there was no suggestion that infection was acquired in any other way than by the mouth, but in that year Looss published his first communication on the entry of the larvæ of Ankylostoma through the skin, and in 1903 gave an account of further experiments which proved that dermal infection resulted in the presence of worms in the intestine. At the meeting of this Association in Cambridge in 1904 Looss demonstrated to a small company his microscopical preparations showing the path of migration of the larvæ. His investigations served to establish the importance of the skin as the chief portal of entry of Ankylostoma, and pointed the way to effective methods of prevention against infection.

Another notable advance in helminthology is the working out of the life-cycle of Schistosoma (Bilharzia)—a genus of trematode worms causing much suffering in Egypt and elsewhere in Africa, as well as in Japan and other parts of the world. We owe chiefly to Leiper’s work (1915–16) our knowledge of the life-history and method of entry into man of the Egyptian species of Schistosoma. He demonstrated that two species of this parasite occur in Egypt, and established that the miracidia develop in different intermediate hosts : those of *S. mansoni* enter Planorbis, while those of *S. hæmatobium* penetrate into Bullinus—the molluscs being abundant in the irrigation canals. The sporocysts produce cercariæ, which escape from the snails and gather near the surface of the water, and experiments with young mice and rats showed that the cercariæ attach themselves to the skin, enter, and reach the portal system, from which they travel to the veins of the lower part of the abdomen. Infection of man takes place chiefly through the skin when bathing or washing in water containing the cercariæ, though infection may also occur through drinking such water. And so, at last, these worms which have troubled Egypt for at least 30 centuries have become known in all their stages, and measures for preventing infection—which were of great use during the war—have been devised and curative treatment introduced.

The period under review has obviously been one of great activity in research on helminths, and fertile in measures tending to reduce the risks of infection. Insects, protozoa, and helminths not only inflict direct injury on man ; they also diminish his material welfare by impairing the health or causing the death of his horses, cattle, and sheep, by destroying food crops during growth and, in the case of insects, by devouring the harvested grain. The measure of control which man can gain over insects, ticks, and endoparasitic organisms, will determine largely the extent to which he can use and develop the natural resources of the rich tropical and sub-tropical zone of the earth.

Other applications of zoology to human well-being cannot be dealt with owing to lack of time, but mention should be made of two—the researches on sea-fisheries problems which have formed an important branch of the zoological work of this country for 40 years, and the studies on genetics which made possible an explanation of the mode of inheritance of a particular blood group, and of some of the defects (e.g., colour-blindness and hæmophilia) and malformations which appear in the human race.

COLONIAL HEALTH REPORTS.

Sierra Leone.[1]

THE population of Sierra Leone at the census taken in 1921 was 85,163, of whom 44,142 dwelt in Freetown, the capital. The European resident population in the colony numbered 1161. The general health of both European and African officials compares rather unfavourably with that of the previous year. While the death-rates were lower, the invaliding and general sick-rates and ineffectiveness were higher ; and though the total number of cases of illness treated showed a decrease of 5837 as compared with 1920, this is said to have been due to some extent to the closing of certain dispensaries. There was a mild outbreak of small-pox between April and June, 31 cases with one death, and an increase in malaria of 218 cases. Dysentery showed a marked decrease, from 404 cases in 1920 to 185 in 1921 ; it has almost disappeared from Freetown prison. Helminthic diseases are very prevalent, especially ankylostomiasis, of which there were 118 cases ; eucalyptus oil appears to be efficacious in treatment, also thymol, or beta-naphthol, or both. The health of prisoners is stated to have been "most unsatisfactory" for part of the year ; in the Freetown prison the sick-rate was 66·03, and the death-rate 78·66 per 1000 of average strength, the daily average number in custody being 318. Towards the end of the year, however, the health conditions improved, and dysentery became "almost negligible." Among the European troops in the colony there was not a single death ; the chief cause of sickness was malaria (195 cases). Among the non-European troops venereal disease (179 cases) and malaria (66 cases) were the most prevalent affections.

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[1] Annual Medical and Sanitary Report, 1921. Freetown Government Printing Office. 19[illegible].

The report states that it is difficult to get suitable men for the sanitary service, which is not popular. Progress was made in anti-malarial work at Freetown ; "92,378 houses were inspected, resulting in the discovery of 483 breeding places." As the population of the town is stated as 44,142, it is to be presumed that this means "house-inspections," not individual houses. Oiling of cesspits was carried out, and a mixture of kerosene and "solido disinfectant fluid" was found to be very useful ; the two fluids mix well, and fly breeding is prevented as well as that of mosquitoes. A slight outbreak of small-pox occurred in Freetown (26 cases) ; this was probably due to introduction of infection from Grand Bassa (Liberia). Vaccination does not appear to be satisfactory. In the colony there were 35,989 children vaccinated during the year ; in 10,917 the operation was successful, in 6794 unsuccessful, but 18,278 other children were not inspected ; even in Freetown, out of a total of 14,708 there were 9653 not inspected. When small-pox became epidemic in Freetown Police District vaccination was made compulsory. There has been a great reduction in the prevalence of dysentery ; only 184 cases were treated in Government institutions in 1921, as compared with 394 in 1920, and 574 in 1918. On account of the prevalence of intestinal disorders in Freetown an extensive examination of tinned foodstuffs was carried out, with the result that several thousands of articles were destroyed by order of the magistrate, including 5764 tins of sardines and 132 barrels of biscuits. It is disquieting to hear that there was a scarcity of water at Freetown from the middle of March to the middle of May, and that the city was placed on a restricted supply. "The problem of further increasing the water-supply will sooner or later have to be faced and seriously grappled with." To an outside observer it would appear to be a matter requiring immediate action. The average maximum temperature at Tower Hill, Freetown, was 91° F. in February and March, and 90° in January and April ; in January and February no rain fell at all, and in March only 0·11 inch. A restricted supply under such conditions would entail hardship, and might be most detrimental to health. On the other hand, it is encouraging to learn that a model village, the first of its kind, has been laid out at Giema, under the local Chief (who had been educated at the school for the sons of Chiefs). It is, of course, not perfect in all respects, but "is one of the best laid out and cleanest villages the senior sanitary officer has seen in Sierra Leone." Dr. J. Beringer concludes his report by urging the necessity for a hospital for infectious diseases at Freetown ; the only accommodation now available is quite unsuited for the purpose.

Weihaiwei.

This territory, leased to Great Britain by China in 1898, is part of the province of Shantung. and comprises a strip of land 10 miles wide, with a coastline of 72 miles. The island of Liukung, lying east and west across the bay, is also included in the territory, and affords excellent shelter from the sea. Port Edward, on the mainland, is the only port, and is also the seat of government. The total area of the territory is 288 square miles, and the native population at the census of 1921 was 154,416. The foreign population is mainly British, and varies from a small number in winter to several hundreds in summer, when visitors arrive from all parts of China in order to enjoy the salubrious climate. In addition, several thousand personnel of the China Squadron spend a few months each summer in the territory. The summer of 1922 was exceptionally hot, but the rainfall was just above the average. General health conditions among the residents and visiting European population on the mainland were exceptionally good. Apart from three cases of dysentery, there were no cases of infectious diseases. There was one birth and one death. There were several cases of septic sore-throat, probably of an infectious nature, affecting only newcomers to China. The health of the native population was good. During the first and the last two months of the year a number of mild cases of influenza were treated. The number of cases of dysentery and diarrhœa treated was 256, as compared with 350 in the previous year. There were 31 persons holding licences to smoke opium, their average age being 63. The highest mean temperatures in 1922 were 80 in June and 86 in July and August. Rain or snow fell on 78 days, with a total rainfall of 24·84 inches. The snowfall in November was 3 feet, the deepest within the memory of any inhabitant.

Gambia.

In a report prepared by Mr. C. R. Workman, Colonial Secretary, on the affairs of the Colony and Protectorate for the year 1922, it is recalled that the Gambia, though the smallest, is the oldest of the possessions of England in Africa. The population of Bathurst, the chief town, is 9395, with 205 Europeans. The death-rate in 1922 was 46·62 per 1000, the average since 1916 having been 42 per 1000. The chief causes of death were pneumonia and tetanus. Accurate statistics from the Protectorate are not obtainable, but a careful return from the North Bank Province for 1922 gives 1628 births and 905 deaths. In this Province an outbreak of bubonic plague occurred which was traced to a focus in French Senegal ; 34 cases were counted, and only four of them recovered. Active measures were taken to isolate the infected villages, and control stations were established on the route to Bathurst. It was only by vigilance and a strict enforcement of regulations that the capital was saved from a visitation of the disease. The meteorological returns from Bathurst for 1922 showed : Average maximum shade temperature, 92·2° F. ; average minimum shade, 63·4° F. ; average mean, 77·8° F. ; rainfall, 45·71 inches.

THE "MINTITE" PATENT FINISH HOT-WATER BOTTLE.

WE have previously reported upon the heat and acid-resisting qualities of "Mintite" patent finish for articles made of indiarubber. This finish, which is an application of mica, is now used for hot-water bottles, and, in addition to the advantages already mentioned, it is claimed that tensile strength is increased. Hot-water bottles treated by this method should certainly possess a longer life than the ordinary untreated rubber article. The patentee is Mr. Louis Minton, Trevelyan Buildings, Manchester.

Summer Time will cease on Sunday next, Sept. 16th, a 3 A.M., when the clock will be put back to 2 A.M. The hou 2–3 A.M. Summer Time will thus be followed by the hou 2–3 A.M. Greenwich Time. Summer Time will be prolonge in France, Belgium, and Holland until Oct. 6–7th.

Mr. F. F. Burghard informs us that he has retired fro practice and has left London. His permanent address i Craythorne, Rolleston, Burton-on-Trent, Staffs.

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CONTENTS

THE WHOLE OF THE LITERARY MATTER IN THE LANCET IS COPYRIGHT.

- **A LECTURE** on Insulin and its Value in Medicine. By Prof. J. J. R. Macleod, F.R.S., M.B., Ch.B. 591

ORIGINAL ARTICLES.

- Bacterial Infection of the Urinary Tract in Infancy and Childhood. By E. Bellingham Smith, M.D., M.R.C.P.—(*Illustrated*) 595
- Pulmonary Amœbiasis. By Philip Manson-Bahr, *D.S.O.*, M.D., F.R.C.P.—(*Illustrated*) 599
- Gastromyotomy: An Operation for the Cure of Chronic Ulcer of the Stomach. By T. C. Clare, M.D., F.R.C.S. 602
- Alkali Deficit in Nephritis. By John R. Marrack, *D.S.O.*, M.D. 604
- A Medical Student's Impressions of Some Continental Hospitals and Their Methods. By G. E. C. Collis 634

REVIEWS AND NOTICES OF BOOKS.

- Hygiene and Public Health. By Louis C. Parkes, M.D., and Prof. H. R. Kenwood 606
- Théorie colloïdale de la biologie et de la pathologie. By August Lumiere 607
- Practical Bacteriology. Blood Work and Animal Parasitology. By Surg.-Gen. E. R. Stitt, A.B., Ph.G. 607
- Practical Bacteriology for Chemical Students. By David Ellis, Ph.D., D.Sc., F.R.S.E. 607
- Chirurgie Vasculaire Conservatrice. Par P. Moure 607
- Post Mortem: Essays Historical and Medical. By C. MacLaurin, M.B., C.M., F.R.C.S.E., LL.D. 608
- Traité d'Ophtalmologie. By Dr. A. Poulard 608
- Montaigne and Medicine. By James Spottiswoode Taylor, M.D. 608
- Encyclopédie Française d'Urologie. Edited by Prof. A. Pousson and Dr. E. Desnos 609
- Poisonous Plants of All Countries. By A. Bernhard-Smith, L.M.M.S.A. 609
- Differential Diagnosis of Internal Diseases. By Prof. M. Howard Fussell, M.D. 609
- Accidents du Travail. Par Léon Imbert, C. Oddo, P. Chavernac 609
- Hodgkin's Disease. By R. A. Bennett, M.D., M.R.C.P. 610
- Pocket Cyclopædia of Nursing. Edited by R. J. E. Scott, M.A., B.C.L., M.D. 610
- Principles of Home Nursing. By E. L. Mohs, R.N., A.B. 610

NEW INVENTIONS.

- Suture Removing Forceps (Dr. Frank H. Edwards).—(*Illustrated*) 610
- Combined Irrigation Tray and Pelvic Rest (Mr. Thos. B. Mouat).—(*Illustrated*) 610

LEADING ARTICLES.

- The State of Public Health 611
- Cancer and Diet 612
- The Kitchener Memorial Medical School 612

ANNOTATIONS.

- The Hospital Almoner and Social Service 613
- Symbiosis 614
- Blood Pressure in the New-Born 614
- Congenital Miosis 614
- The Wassermann Reaction in Leprosy 614
- A Visit to Medical Schools in Canada and the United States 615
- Prophylactic Injection of Normal Serum against Measles 615
- The British Journal of Experimental Biology .. 615
- Sir Thomas Browne's Skull 616
- Scientific Exhibits at the British Association Meeting 616
- St. Mary's Hospital Post-Graduate Course 616
- Atomic Physics 617

MODERN TECHNIQUE IN TREATMENT.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

- XXXVII.—Treatment of Chronic Arthritis. By W. H. Wynn, M.D., M.Sc., F.R.C.P. 617

SPECIAL ARTICLES.

- The International Health Offices. Proposals for New Usefulness: The Basis of Permanent Organisation. — International Differences in Cancer Mortality.—Comparative Data in Other Diseases.—Malaria and Sleeping Sickness.—International Agreements and Questions of Standardisation. — Special Activities of the Geneva Health Office .. 619
- Vienna: The Census Figures for 1923 621
- Berlin: Care of War Victims.—Treatment of Tuberculosis 622
- Story of the Small-pox Epidemic in Gloucester 625
- The Dental Student: A Guide to Teaching Institutions in Dentistry 627

PUBLIC HEALTH SERVICES.

- Reports of Medical Officers of Health: Leeds.—Wigan. — Bury. — East Ham.—Derby.—Bournemouth 622
- School Medical Service: Derbyshire 624

CORRESPONDENCE.

- Ophthalmological Training for Medical Students (Mr. Freeland Fergus) .. 630
- Pathological Departments (Prof. James Walter McLeod) 630
- Lilliputian Dosage (Mr. E. N. Allott) 631
- Wellcome Bureau of Scientific Research: A Correction (Dr. Andrew Balfour) 631

THE SERVICES.

- Royal Naval Medical Service.—Royal Army Medical Corps.—Royal Air Force.—Indian Medical Service.—Deaths in the Services 629

MEDICAL NEWS.

- London Hospital Medical College 631
- Society for the Study of Inebriety 631
- Royal Institute of Public Health 631
- Royal Sanitary Institute .. 631
- Maudsley Hospital 631
- Radcliffe Infirmary, Oxford 632
- Sociological Society 632
- North-East London Clinical Society 632
- Medical Society of London 632
- Manchester's Public Health Committee 632
- Presentation to a Medical Man 632
- Financial Needs of Leeds Hospitals 632
- The late Dr. W. Case, J.P. 632
- The late Dr. John McMurray 632
- Donations and Bequests .. 632
- Measurement of Progress in Public Health 633
- University College Hospital 633
- Fatal Accident to Galway Medical Man 633
- Foreign Decoration 633
- Dublin Labour Dispute and Supply of Drugs 633
- A Link with Florence Nightingale 633
- The late Dr. William White J.P. 633
- The late Mr. H. D. Farnell 634

NOTES, COMMENTS, AND ABSTRACTS.

- Public Health in Bihar and Orissa—(*To be continued*) 635
- The Nature and Use of the Air 636
- Polished Rice and Beri-beri 636
- Vaccination in the N.W.F. Province, India 636
- A Hygienic Breast-Pump .. 636
- London Doctors and Dental Surgeons, 1923–24 636

- Medical Diary 633
- Appointments 633
- Vacancies 633
- Births, Marriages, Deaths 634

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THE LANCET, SEPTEMBER 22, 1923.

A Lecture

ON

INSULIN AND ITS VALUE IN MEDICINE.

Delivered before the Section of Physiology of the British Association at Liverpool on Sept. 17th, 1923,

BY J. J. R. MACLEOD, F.R.S., M.B., CH.B. ABERD.,
PROFESSOR OF PHYSIOLOGY IN THE UNIVERSITY OF TORONTO.

AMONG the complex chemical changes which go on in the animal body and upon which life depends, carbohydrates play an essential rôle. Their sources in the herbivorous animals is mainly the cellulose and starch synthesised by plants and in the carnivorous animals it is partly the starch-like substance called glycogen as which they are stored in animal tissues, and partly proteins and, to a less extent fats, from which they are derived by chemical changes occurring in the body. The starch or cellulose taken with the food is resolved by the digestive process into the so-called monosaccharides of which glucose is the most important. The glucose is absorbed into the blood and is carried to the liver and muscles where most of it is converted into glycogen. Between the periods of absorption of glucose the reverse process occurs and glycogen becomes broken down to glucose again, which is then oxidised in the tissues (muscles) so as to produce energy, the final products of this oxidation being carbon dioxide and water. While digestion is proceeding the supply of glucose for oxidation may come directly from the glucose which is being absorbed from the alimentary canal, but of this we cannot be certain. In any case, before it can be oxidised in the tissues the glucose molecule must undergo a series of preliminary changes and it is probable that these proceed step by step in such a manner that a long series of intermediary substances is formed each one of which exists in a certain state of dynamic equilibrium with the others so that an increase, or a decrease, in any one of them will cause a disturbance extending throughout the entire process.

CARBOHYDRATE METABOLISM.

It is a study of these changes that constitutes the subject of the metabolism of the carbohydrates, and the question arises as to how they may be investigated. Glucose and glycogen are the only two intermediary products that accumulate in the body in sufficient quantities to be measurable by chemical means, the glucose being dissolved in the blood and other fluids of the body and the glycogen, deposited in the solid tissues, particularly the liver and the muscles. Our conclusions concerning the metabolism of the carbohydrates have therefore to be drawn mainly from observations on the changes which occur in the quantities of these two substances in the blood, urine and tissues and from the behaviour of the respiratory process of the animal as a whole.

But the metabolism of the carbohydrates does not proceed independently, for, in the chain of processes which precede the final oxidation of glucose, some substance is formed which is also intermediary in the metabolism of the other proximate principles of food—namely, fats and proteins. Through the formation of this intermediary substance transmutation of one proximate principle into another becomes possible, thus carbohydrates may be formed from proteins and fats from carbohydrates. The metabolism of the three proximate principles, therefore, is closely interwoven so that when anything occurs to interfere with that of one of them some change is likely to occur in the others. When the metabolism of carbohydrate becomes upset, for example, that of fats also goes out of order, with the result that incompletely oxidised derivatives, known as the ketone bodies, accumulate in the body and may act as poisons.

A Break in the Metabolic Cycle.

These facts will make it evident that the entire process of metabolism is liable to become upset when anything occurs to prevent the transformation of one of the intermediary carbohydrate substances into the others and this is precisely what occurs in the disease known as diabetes. Somewhere in the series of metabolic processes which precede the oxidation of glucose an essential chemical change fails to proceed rapidly enough to keep pace with the other changes with the result that this sugar accumulates in the blood in which its concentration becomes so high that some is excreted by the kidneys and appears in the urine. Hyperglycæmia and glycosuria, the two earliest symptoms of the disease, are thus explained and for long there may be no other symptom. Usually, however, the fault upon which they depend becomes still more pronounced, so that its effects spread further along the chain of metabolic processes and the final oxidation of glucose fails to occur as is revealed by a failure of the respiratory quotient—the ratio between oxygen and carbon dioxide in the respired air—to become raised as it should following the ingestion of carbohydrates. The metabolism of fats also comes to be interfered with so that they fail to be completely oxidised, so that serious symptoms supervene, known as diabetic coma, due to the toxic action of the ketone bodies. The entire chemical laboratory of life becomes disorganised with the result that the tissues disintegrate, leading to extreme emaciation and to a lowering of the natural resistance of the body against infections, both of which are other symptoms of the disease.

It is evident, therefore, that the immediate problem of diabetes consists in finding the cause for the fault in the chemical processes by which the glucose molecule is prepared for oxidation. Not so much in detecting the exact stage at which this fault occurs, although this is highly important, as in finding out what has gone wrong with the mechanism by which the metabolic process is controlled.

As a result of long years of investigation both in the laboratory and the clinic it has come to be known that many of the chemical processes in the body are controlled by substances called hormones, and it has been supposed that one of these must also control the process of carbohydrate metabolism. The question was to find this anti-diabetic hormone, as we may call it, and it is this which has been achieved in the discovery of insulin.

EARLY FAILURES TO FIND THE ANTI-DIABETIC HORMONE.

The steps which preceded this discovery extend over many years, and there is probably no chapter in the history of medical science that more clearly shows the value of painstaking and patient research, both in the clinic and the laboratory, than that which records these steps. The earlier investigations culminated in 1889, when it was discovered by von Mehring and Minkowski that removal of the pancreas or abdominal sweetbread from dogs causes severe diabetes from which the animals succumb in two or three weeks. The hypothesis was therefore made that the anti-diabetic hormone is secreted into the blood by the pancreas—an internal secretion—and it was soon found that its action must be entirely independent of that of the (external) secretion into the intestine of the powerful digestive juice, since diabetes did not occur when the pancreatic ducts were tied. This independence of the external secretion and the anti-diabetic function of the gland made it seem probable that each is the function of different portions of the gland, and, as a matter of fact, it was known, through the work of Langerhans, which preceded that of von Mehring and Minkowski by some 20 years, that the pancreas contains islets of peculiar cells embedded in the connective tissue lying between the tubules or acini which are the source of the external secretion. Anatomical investigations, particularly by Diamare and Laguesse, demonstrated that these islets of Langerhans, as they came to be called, are present in all the vertebrates, although in some, such as the bony fishes, they exist, not embedded in the pancreas, but as distinct glands situated in the mesentary apart from this organ. The cells composing them were also found to possess characteristic microscopic features. As this work progressed from the anatomical side pathologists discovered that microscopic changes could frequently be detected in the cells of the islets in patients who had died of diabetes, and the surmise that they must produce the internal secretion which controls carbohydrate metabolism became so strong that the name insulin was suggested for it by Sir E. S. Schafer. But so far there was no direct evidence to support the hypothesis that it is by secreting insulin into the blood that the pancreas owes its control over carbohydrate metabolism. This could be furnished most satisfactorily, by showing that an extract prepared from the pancreas or from the principal islets of the bony fishes was capable of removing the symptoms in a depancreated dog or a diabetic patient. Attempts to prepare such extracts by the usual means were, however, without success, and some investigators concluded that the power of the pancreas to control carbohydrate metabolism must depend on some other mechanism, not requiring the internal secretion of insulin. Others attributed the failures in the isolation of this hormone to the fact that it was destroyed during the process of extraction by the powerful digestive ferments which such extracts of the pancreas must also contain. To circumvent the action of these, alcohol was tried as the extractive medium by Zuelzer and by E. L. Scott, and here a certain degree of success was attained, both in the laboratory and in the clinic, when for similar reasons, the extracts were administered subcutaneously instead of by mouth. These investigations, which were made in 1908, were not carried far enough, however, to justify the use of the extracts in the treatment of diabetes, being discontinued because of the dangerous toxic effects which followed their administration to man. Some years prior to this (in 1904) Rennie and Fraser also tried to obtain active extracts by using the principal islets of bony fishes which, as we have seen, are homologous with the islets of Langerhans of the mammalian pancreas. As more recent work has shown that these structures are by far the richest known source of insulin, it is remarkable how near these workers came to success. They failed to convince others partly because they did not have at their disposal the more recently evolved methods for measurement of the percentage of sugar in the blood, and partly because they usually gave, either the fresh glands or extracts of them, by mouth instead of subcutaneously.

Demonstration on Animals.

Discouraged by these repeated failures most physicians gave up all hope that a pancreatic extract capable of removing the symptoms of diabetes would ever be discovered, and the search for insulin became the problem of the physiologist. It was necessary in the first place to demonstrate that such a hormone really exists in the animal body, quite apart from its isolation in extracts. This was achieved in 1916 by A. H. Clark, who compared the rate at which glucose is used by the isolated mammalian heart kept alive by perfusing it with a nutritive fluid alone with that of one perfused with fluid which had previously been passed through the blood-vessels of the pancreas. Decidedly more glucose was found to disappear from the solution that had passed through the pancreas, indicating that a hormone stimulating sugar utilisation must have been added to it.[1] The experiment showed conclusively that the pancreas does produce insulin, and it remained to devise means by which the hormone could be preserved in extracts of the gland. To succeed in doing so required the development of some new and untried method of attack, and this was suggested by F. G. Banting. His plan was to make extracts, not of the fresh normal pancreas, as others had done, but of pancreas which had been caused to undergo partial degeneration by entirely blocking the secreting ducts, previous investigators having shown that this degeneration does not greatly affect the isles of Langerhans, but mainly the cells which produce the digestive juice. With the assistance of C. H. Best, Banting blocked the ducts by tying them in dogs, and some weeks later removed the degenerated pancreas and made extracts from it. When these were injected into other dogs that had been rendered diabetic by removal of the pancreas, it was found that the two main symptoms of the disease, hyperglycæmia and glycosuria, were greatly diminished. This showed with little doubt that the anti-diabetic hormone could be extracted from the pancreas provided its destruction by the digestive ferments was circumvented. The next step was to find methods by which extracts containing it could be made from the intact gland, for, of course, the supply from partially degenerated pancreas could never be sufficient to investigate thoroughly the full physiological action of the extract and thus to determine its possible clinical value. Extracts of early fœtal pancreas were tried by Banting and Best, since it was known that the digestive ferments are absent until shortly before birth. They were found to have the same action as those from the degenerated gland, and this led to a re-trial of alcoholic extracts of the normal undegenerated gland of cattle. Again successful results were obtained, and not only were the hyperglycæmia and glycosuria found to be diminished by the extracts, but by their repeated injection the diabetic animals improved greatly in general condition, and one of them lived for over two months, when it was killed for investigation.

Provided with a larger supply of extract, it now became possible to test its effect on the other symptoms of diabetes in animals. Besides hyperglycæmia and glycosuria, these symptoms are that after feeding with carbohydrates glycogen fails to be deposited in the liver, the relationship between the intake of oxygen and the output of carbon dioxide acid in the respired air—the so-called respiratory quotient—does not become altered. Fats also accumulate in the liver and blood, and, since the carbohydrate fires are burning low, they fail to be completely oxidised and appear as ketone bodies in the urine. These objective symptoms, common to depancreatised animals and diabetic patients, are associated with others of a subjective nature and extreme emaciation. With the invaluable assistance of J. B. Collip, the symptoms were found to be promptly removed by the extract. It has since been found, if insulin be given daily and excess of fat removed from the diet, that the depancreatised animals can be kept alive in excellent nutritive condition for over four months at least.

Application to Man.

These results obtained in the physiological laboratory proved conclusively that the elusive anti-diabetic hormone had been discovered, and that the time had now arrived to see whether the extracts would be equally efficacious in removing the symptoms of diabetes in man. The first attempts to do this were met with the difficulty that the extract caused considerable irritation at the site of injection, so that the injections could not be sufficiently repeated to test their real value although a temporary reduction in the hyperglycæmia and glycosuria were found to occur. The clinical application of the discovery of insulin came to depend on the removal from the alcoholic extracts of pancreas of the irritating substances, and this was achieved by Dr. J. B. Collip by a method of fractional precipitation with alcohol. By the use of the purified preparation it soon became possible to show that the results of the laboratory were precisely duplicated in the clinic, and it will suffice if I describe those obtained by Banting, Best, Collip, Campbell, and Fletcher on a boy of 14 years suffering from the acute form which the disease usually takes at this age. Hyperglycæmia, glycosuria, ketonuria, and extreme emaciation were prominent objective symptoms, and they could not be removed by the most careful dietetic treatment. The boy had lost all interest in his surroundings and lay in bed most of the time. There was little prospect that he could live for many months longer. Injections of insulin given, usually twice daily, from Jan. 23rd to Feb. 4th, 1922, had an immediate effect in removing all of the symptoms, with the exception that small amounts of sugar appeared occasionally in the urine due quite clearly to the fact that sufficient insulin had not been given. "The boy became brighter, more active, looked better, and said he felt stronger," and it was difficult to realise that the serious invalid of yesterday had become the convalescent of to-day.

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[1] E. J. Starling and others had previously shown that acid extracts of pancreas often caused the isolated heart to use more sugar.

Large Scale Production.

With the aid of the Connaught Antitoxin Laboratories of the University of Toronto work was now started to produce insulin in larger quantities, but the serious difficulties which were encountered made it impossible to obtain enough to treat more than a few cases during the early months of 1922. Later in the year, by collaboration with manufacturing firms in the States, and, through the Medical Research Council in this country the supply became sufficient, so that samples were sent for clinical trial to several hospitals and much information regarding the therapeutic value of insulin in the different forms of diabetes soon became available. These show it to be invaluable in the treatment of acute cases in which the symptoms cannot be removed by the most careful dietetic control. Especially in coma is insulin invaluable, for by stirring up the fires of carbohydrate combustion insulin quickly rids the organism of the ketone bodies to which this, often fatal, symptom is due. Insulin undoubtedly saves the lives of many of these patients. Equally useful has it proved to be in less acute cases in which either, because of dietetic indiscretion, or the incidence of some acute infection such as influenza, the symptoms have become suddenly acute and dangerous.

The milder types of diabetes, which are relatively common in the later years of life, are usually amenable to dietetic treatment alone, and do not require insulin except when complications supervene, such as gangrene or some concurrent acute disease, and it is probable that the constant use of insulin is unnecessary in about three-fourths of all cases of the disease. Its value in the majority of cases is when emergencies arise, for example, by treatment with insulin for some days preceding the administration of anæsthetics for surgical purposes, the grave risks under which the operation was previously conducted in diabetic patients are greatly minimised. But it must not be overlooked that even in the routine treatment of these chronic cases insulin may prove of value. In this connexion it is significant that A. N. Allen, working in my laboratory, has found that the amount of sugar which disappears from the urine for each unit of insulin when it is given to depancreatised dogs in small doses is much greater than with large doses. It may prove useful, therefore, to give small doses of insulin in the more chronic type of case which, for one reason or another, is not responding favourably to dietetic measures alone

Method of Administration.

This naturally raises the question of the method of administration. In acute cases this must be subcutaneously or intravenously so as to circumvent the destruction of insulin by the powerful digestive juices of the stomach and intestine, but it is possible when only small amounts are required, as in mild cases, that sufficient absorption may occur from the skin by applying an ointment, or from the alimentary canal by oral administration.

It is often asked whether treatment with insulin brings about a cure of the disease; does its repeated administration by taking the strain off the endogenous production of insulin by the patient's pancreas allow this gland to recuperate its lost function and so make further use unnecessary? I will not venture to reply to this question in definite terms, for it would be rash to do so from the experience of little more than a year since insulin became available. It is nevertheless significant that regeneration of new islet tissue has been demonstrated by R. R. Bensley to occur in the pancreas of certain laboratory animals months after ligation of the ducts, for although, as we have seen, the acini are mainly affected by this operation, the islets also become involved to be replaced later by new islet tissue. Diabetes, if untreated, is a progressive disease, probably because of the strain which is put upon the remaining, still unaffected, islets to supply enough insulin to metabolise the carbohydrates in circulation. If this faulty balance between insulin and carbohydrate is corrected, either by reducing the carbohydrate supply through dietary regulation or by supplying more insulin from without, the strain on the islets may be so far relieved that they can develop their inherent powers of regeneration.

VALUE OF INSULIN IN METABOLIC INVESTIGATIONS.

Although there can be no doubt of the high therapeutic value of insulin in the treatment of many cases of diabetes, its value as a new instrument for the investigation of other problems of metabolism than those relating to this disease is also high. It furnishes the physiologist with a new instrument for the investigation of the many problems connected with the chemical processes which go on in the body—with a key which may serve to unlock some of the numerous doors which stand in the way to an understanding of the working of the animal machine. Evidence for this belief is founded among other things on the striking effects of insulin on normal animals. When it is administered to rabbits, for example, the first effect is a very rapid lowering in the percentage of sugar of the blood—first observed by J. B. Collip—and when this reaches a certain level symptoms of a peculiar nature supervene. These consist usually of violent convulsive seizures each lasting for a minute or so, and of a gradually increasing state of coma, with a fall in body temperature, ending often in death from respiratory failure. Symptoms of a similar character occur also in other animals, including man, after large doses of insulin. There are often premonitory symptoms and in man these are extreme hunger, anxiety, tremulousness, and, later, quickened pulse and sweating. In searching for the cause of these remarkable symptoms we were guided by the observation, made two years previously by Mann and Magath, that the somewhat similar symptoms which develop in dogs after removal of the liver are dependent on the lowering of blood-sugar and can be relieved by injections of glucose. Could the symptoms following insulin be due to the same cause? We very soon found this to be the case, the evidence being, partly, that they usually supervene in normally fed animals when the blood-sugar has fallen to about 0·045 per cent. and partly that they are removed immediately by the addition of glucose to the blood either by administering this sugar subcutaneously or by causing it to be liberated in the body from glycogen, as by the injection of adrenalin. It was found, moreover, that of all the sugars glucose alone has an immediate and lasting effect, even lævulose and galactose, which are its nearest neighbours, having only a slight and transitory action. The symptoms, therefore, are related to a reduction in the concentration of glucose in the blood and must be dependent upon the consequent lowering of free glucose in certain of the tissues; to a condition of glucatonia, we may call it. Why this should be associated with the development of symptoms which are evidently due to abnormal stimulation of the nerve centres that control muscular action is difficult to explain. It looks as if some toxic substance had developed, whose formation is ordinarily prevented by the presence of free glucose, or it may be that a certain tension of free glucose is essential for the chemical interchanges that are associated with the physiological functioning of the cells, particularly those of the nerve centres. The close similarity of many of the symptoms with those observed in anoxæmia suggests the possibility that interference with the processes of intracellular oxidation is really responsible for the symptoms, and this view is fortified by the fact that the arterial blood becomes intensely venous in colour when the symptoms supervene. Whatever may be their immediate cause, the discovery that the symptoms are related to hypoglycæmia and can be antidoted by glucose proved to be of great practical importance, for it sounded a note of warning in the use of insulin on patients and it provided a certain remedy should similar symptoms supervene as a result. Possibly, also, it explains in part at least the cause for the toxic symptoms on account of which previous observers, such as Zuelzer, had been compelled to abandon their investigations of the value of extracts of pancreas in the treatment of diabetes in man.

Although the symptoms commonly occur in well-fed animals when the blood-sugar is about 0·045 per cent., they may fail to be observed until a much lower level has been reached. This is particularly the case when a large dose of insulin is given some time after food. The liability of symptoms to occur at about 0·045 per cent. of blood-sugar has served as a useful basis for measurement of the dosage of insulin, one unit being defined as the amount which can lower the blood-sugar to the convulsive level of 0·045 per cent. within four hours in rabbits weighing about 2 kg. Since this "physiological" unit, as it is called, is said to be stronger than is necessary for certain clinical purposes it has been decided for the present to use, as the "clinical" unit, one that is one-third the above strength. This question of the physiological assay of insulin is receiving much attention at present.

Cause of Reduction in Blood-Sugar.

These observations clearly pointed the way to the next problem—namely, the cause for the lowering of the blood-sugar. At first it seemed as if this should soon be solved, for, as already mentioned, it had been found by Banting, Best, and Collip that insulin not only causes glycogen to be deposited in the liver of diabetic animals when sugar is given, but also causes the respiratory quotient to become raised in a manner to indicate that there is increased combustion of carbohydrate. It seemed likely that stimulation of the same processes in the normal animal under insulin must be responsible for the disappearance of glucose from the blood. But the experimental evidence goes to show that the mechanism of action is much more complex. Glycogen is certainly not formed when insulin is given to normal animals (McCormick, Macleod, O'Brien, and E. C. Noble); indeed, it is decreased in amount[3] (Dudley and Marriam), and no certain evidence can be obtained from respiratory experiments that more active combustion of glucose is a necessary accompaniment of the lowering of blood-sugar. The consumption of oxygen greatly increases in dogs preceding the onset of symptoms, and the respiratory quotient usually becomes somewhat raised (Dixon, Eadie, Macleod, and Pember), but in mice changes of an opposite character occur (Dudley, Laidlaw, Trevan, and Boock), and in rabbits they are at first like those in dogs, though less marked, and subsequently like those in mice. The glucose which disappears is apparently neither oxidised to carbon dioxide and water nor polymerised into glycogen. For the present the problem is unsolved, but we must not lose sight of the possibility that insulin changes both glucose and glycogen into some intermediary product which we fail to identity with our present methods of analysis either because it does not give the reducing reactions upon which the detection and estimation of sugars depend, or because it is not precipitated by alcohol after treatment with strong alkali, which is the characteristic property of glycogen. That such substances may exist in the tissues is indicated by the fact that it is impossible after injecting large amounts of sugar into animals to recover much more than one-half by chemical analysis of the entire body.

Acts in the Tissues, not in the Blood.

Whatever may be the nature of the mechanism by which the blood-sugar becomes lowered there is no doubt that it acts in the tissues and not in the blood itself (Eadie and Macleod). Thus, the addition of insulin to blood incubated outside the body does not alter the rate at which the sugar disappears from it, and when the isolated heart is perfused with a suitable saline solution containing sugar the addition of insulin to the solution causes this to lose its sugar more rapidly (Hepburn and Latchford).

The hypoglycæmic effect of insulin lasts for a period which varies in different animals. In rabbits the blood-sugar often begins to rise again in about an hour after the injection, but this depends very largely on the amount of glycogen which is stored in the liver. This becomes converted into glucose to replace that lost from the blood, so that well-fed animals show much quicker recovery, and can withstand much larger doses of insulin, without the development of symptoms, than those previously starved. This mobilisation of the carbohydrate reserves would appear to depend on the transmission to the liver through its nerve-supply of messages set up by the hypoglycæmic condition, for Burn has shown that if the nerve pathway (splanchnic) be blocked by the drug ergotonine, insulin causes in well-fed animals more profound a degree of hypoglycæmia than otherwise. The importance of the glycogen reserves in combating the hypoglycæmic effects of insulin warns us that we must be careful in giving it to diabetic patients in whom, as we have seen, these are abnormally low.

OTHER PHYSIOLOGICAL PROBLEMS.

Numerous other problems relating to the physiological action of insulin are being investigated, but time will not permit of more than a brief allusion to one or two of them. One is its effect on hyperglycæmia due to other causes than removal of the pancreas. These include administration of glucose either by mouth or parenterally—exogenous hyperglycæmia we may call it—and increased production of glucose from the glycogen stores of the liver—endogenous hyperglycæmia. This increased breakdown of glycogen may be brought about by a variety of experimental conditions which are conveniently classified as nervous and asphyxial. Under the former category are included puncture of the floor of the fourth ventricle of the medulla and stimulation of the sympathetic nerve-supply of the liver, either electrically or by the injection of epinephrin; and under the latter, besides the various forms of asphyxia itself, the effect of numerous drugs such as the anæsthetics. So far as it has been investigated insulin is capable of preventing the development of hyperglycæmia in all these conditions. Most attention has been paid to its effect on the hyperglycæmia due to epinephrin, partly because of the possibility that insulin may be assayed by determining the amount necessary to antidote a known amount of epinephrin, which itself can be accurately assayed, and partly because an investigation of the physiological antagonism between these two hormones may throw some light on the mechanism of the action of insulin. Let me give one example to illustrate. We have seen that insulin causes the glycogen stored in the liver to become less in amount, acting in this regard like epinephrin, although probably much less quickly. When insulin is given along with epinephrin, however, glycogen disappears from the liver much more slowly than with epinephrin alone, indicating that under certain conditions the pancreatic hormone arrests rather than stimulates the breakdown of glycogen (E. C. Noble). When these two hormones are in excess in the body the one prevents the other from causing glycogen to disappear. Another curious result of a somewhat similar nature has been obtained by Burn with pituitrin, a hormone derived from the pituitary gland. When it is given along with epinephrin it prevents hyperglycæmia, and when it is given with insulin it prevents hypoglycæmia. I have mentioned these results to indicate the very puzzling nature of the problem of the action of insulin and to show that this action may possibly be linked with that of other hormones in the animal.

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[3] This disposes once and for all of the suggestion that the hypoglycæmia is due to a shutting-down of the production of glucose from the liver, which is further confirmed by the observation of Mann and Magath that insulin has its usual hypoglycæmic effect after removal of the liver.

Another interesting effect of insulin is on the peculiar form of experimental diabetes caused by the drug phloridzin. Glycosuria occurs without there being any increase in the blood-sugar and the oxidation of carbohydrate becomes interfered with, as revealed by a failure of the respiratory quotient to respond to the ingestion of sugar. Now, it is significant, as S. U. Page has found, that when insulin is given along with sugar to dogs completely under the influence of phloridzin the respiratory quotient becomes decidedly raised and the glycosuria lessened.

Whatever the mechanism of the action of insulin may be, it is important to bear in mind that the direction of its control of carbohydrate metabolism is apparently not the same in the diabetic as it is in the normal animal, for in the former it causes increased formation of glycogen and greater combustion of glucose, whereas in the latter it inhibits the former process, if not indeed exciting glycogenolysis, and it does not necessarily stimulate the combustion of glucose. Where there has been a deficiency of insulin for the physiological control of carbohydrate metabolism, as in the diabetic, its replacement, by injection, causes those intermediary products of carbohydrate metabolism which have accumulated in the body because of its absence to be immediately transformed. Insulin oils the halting machinery of carbohydrate metabolism in diabetes and allows it to run smoothly again, but it interferes with the action of this machinery when it is given to a normal animal in whom there is already a sufficient supply of it for all physiological purposes.

CHEMICAL NATURE OF INSULIN.

Little is as yet known regarding the chemical nature of insulin. Many of its reactions are similar to those given by proteose, an early digestive product of protein. This probably explains why it is so readily destroyed by the ferments of the pancreas and stomach and cannot be successfully given by mouth. In the purest preparation from ox pancreas all of the characteristic colour reactions of protein are absent except the biuret reaction. It contains no phosphorus or carbohydrate but a large percentage of sulphur. This would seem to indicate that it must be some low form of protein, although it is possible that it may not belong to this class of bodies at all but be some simpler substance with protein derivatives attached to it as impurities. In this connexion it is significant that very active insulin has been prepared from the pancreas of the skate in which the biuret test could not be obtained. With regard to its solubilities, upon which, of course, its isolation depends, neutral alcohol up to about 80 per cent. dissolves it, so also does water, but it is precipitated in very weak acid (pH 4–6), and in the presence of high concentration of neutral salts. It is also precipitated by such reagents as picric and benzoic acids and it forms a salt with hydrochloric acid. The Collip process for its isolation in a state of sufficient purity for clinical use depends on dissolving it out of the macerated pancreas by weak (60 per cent.) alcohol, evaporating the extract to small bulk in vacuo, removing foreign proteins by stronger alcohol (80 per cent.), and fats by centrifuging or by ether, and finally precipitating the insulin by increasing the alcohol to 90–92 per cent. Further purification can then be effected by re-precipitating either by very weak alkali (Shaffer-Doisy method) or by means of picric acid (Dudley method). In faintly acid reaction it withstands heat, for example, such a solution can be continuously boiled for over an hour without perceptible deterioration, but in faintly alkaline reaction heat soon destroys it. It does not dialyse in faintly acid reaction in which also it is readily adsorbed by charcoal and kaolin. These facts are sufficient to show that insulin is a substance of complex chemical structure, which indicates that its isolation in a chemically pure state will be a matter of great difficulty. Its preparation by synthetic means is therefore at present out of the question.

Finally, let me say a word concerning the insulin-like substances which have been prepared by Collip's process from numerous sources such as yeast and fungi. Most of these differ from insulin prepared from the pancreas of mammals or from the principal islets of the bony fishes in that they only slowly reduce the blood-sugar; indeed, this effect may be delayed for a day or so. The possibility therefore exists that they merely act by stimulating the production of insulin from the pancreas, and if this be the case they can scarcely be of much value in the treatment of diabetes.

BACTERIAL INFECTION OF THE URINARY TRACT IN INFANCY AND CHILDHOOD.*

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BACTERIAL infection of the urine occurs from earliest infancy throughout childhood, and cases presenting such infection must appear to all of you general practitioners at some time or other. My own experience is that, owing to the variety of symptoms which arise, that it frequently goes undiagnosed or is mistaken for a number of other complaints. The urine of infants and children may be the habitat of various bacteria, amongst which I may mention the staphylococci, streptococci, *B. coli*, *B. typhosus*, *B. proteus*, *B. pyocyaneus*, *B. tuberculosis*, and *B. diphtheriæ*. Of the diseases associated with these bacteria, typhoid is becoming rare in this country, and in only a small percentage of cases is *B. typhosus* recovered from the urine. Similarly, while certain types of tuberculosis are common in childhood, an infection of the urinary tract alone is rarely seen. Of all these infections by far the most common is that by *B. coli* alone, or in conjunction with the staphylococcal or streptococcal group.

Apart from infections where an organism can be isolated, we have that large group of nephritis cases, some of which follow the specific fevers, such as scarlet fever and pneumonia, or are syphilitic in origin, and a still greater number, so-called idiopathic, all of which are admittedly infective, but in the greater number of which it has as yet been impossible to isolate the causal agent. The infective nature of the last group, which at one time we were willing to attribute to chill, is well shown by the following experience I had recently when I was asked to see a family of three small boys, all of whom had nephritis. There was no antecedent history of any infectious illness or sore throat; the second boy was taken ill five days after the first, the third some seven days later. In each case there was acute nephritis with hæmaturia, albuminuria, and casts. Cultivation, however, of a sterile specimen of urine yielded no results, despite the apparent infectivity of this disease from one child to another. I do not propose to deal any further with this class of uncertain origin, but will confine my remarks to that in which it is possible to isolate an offending organism. And of these organisms I propose only to deal with the *B. coli* alone or in conjunction with the staphylococci or streptococci.

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* A paper read before the Lincoln Medical Society.

Infection of the urine by the *B. coli*, staphylococci, and streptococci occurs either as a primary disorder or as a complication in some other general systemic infection, as a sequel of diarrhœa and vomiting or chronic constipation, as a secondary infection in congenital malformations of the kidneys, or with renal or bladder calculi, in meningeal states, and in cases where there has been immobilisation in plaster for a long period for spinal and hip disease. Finally, it must be remembered that any of these organisms may be present in the urine without there being, of necessity, any corresponding signs of inflammation of the urinary tract or any disturbance of health. We have then to consider this condition under these headings: (1) Bacterial infections without pathological changes in the urine, stone, or complicating other diseases; (2) bacterial infections, a primary disorder, with pathological changes in the urine; (3) bacterial infections, complicating other diseases and giving rise as well to pathological changes in the urinary tract.

Bacterial Infections without Pathological Change in the Urine.

Cases falling under this heading are of three classes: (*a*) those infants and children who at one time have had a definite acute infection but have since developed an immunity to their infection without actually freeing their urinary tract from the invading organism; (*b*) infants and children possibly possessing a natural immunity to the organism in question; and (*c*) cases in which the organism present is merely a terminal infection in the cause of some other fatal disorder.

These three classes require little explanation. Of the first I shall have something further to say under the heading of prognosis. The second should be clear to the understanding when we compare such a state with other systems of the body. For instance, pneumococci and other organisms abound in the respiratory tract, but we are fortunately not all of us the subjects of pneumonia. In like way the presence of *B. coli* in the urine does not necessarily foretell a certain pyelitis or pyelonephritis unless the resistance and natural immunity is lowered by some extraneous cause. Possibly to this type belong a limited number of cases of enuresis. Hyperacidity of the urine has been instanced as a cause of incontinence in childhood, and a highly acid state of the urine is a concomitant of *B. coli* infection; moreover, in a few such cases with enuresis *B. coli* has been isolated in limited numbers without there being any evidence of inflammatory changes in the urinary tract. Under the third type we have cases where, in a prolonged or fatally terminating illness, a routine examination of the urine reveals *B. coli* or cocci without evidence of pus cells or albumin; such cases, as one would expect, occur more frequently amongst girls than boys, and should be looked upon as a direct contamination of the content of the bladder by soiling of the vulva by fæces, while the child is unconscious and incontinent. The only important point in these cases is not to overlook the primary diagnosis or confuse it with a real *B. coli* infection.

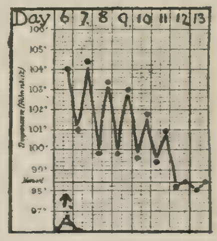
Bacterial Infection with Pathological Changes in the Urine.

We now come to the second heading—*B. coli* infection as a primary disorder with evidence of inflammation and pathological changes in the urine. Theoretically we can divide this group into three subdivisions according as the symptoms denote: (1) a bladder infection or cystitis; (2) a pyelitis or inflammation of the pelvis; (3) a nephritis or inflammation of the kidney substance, which in extreme cases may be suppurative. In practice, however, any two or all three may be equally or to a lesser degree affected at one and the same time. On the whole, the symptoms will vary as to which portion of the urinary system is to the greatest degree involved. Thus, where the bladder is attacked, we have frequent and painful micturition; the urine is cloudy and foul-smelling, and contains quantities of pus and albumin, and occasionally blood. In such cases there may be a mixed infection with staphylococci or streptococci. Pyrexia, on the whole, is absent or only slight. The constitutional symptoms apart from the urinary discomfort are, as a rule, negligible.

In pyelitis, on the other hand, there is, as a rule, distinct constitutional upset. And it is this type of case which frequently goes undiagnosed or wrongly diagnosed.

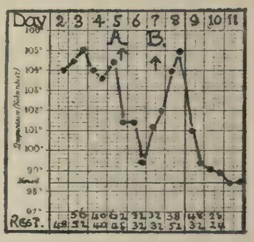
In infancy the onset of the disease is often insidious and is marked by general malaise, anorexia, fretfulness, irritability, pallor of an earthy type, and a rise of temperature, or daily rises of temperature associated with shivering or definite rigors. Such rigors are almost pathognomonic of *B. coli* pyelitis. Dysuria and incontinence or frequency are difficult to determine in young infants, and if present are usually not very marked symptoms, so that the direct relation of the illness to a urinary infection is not always apparent. In older children the onset may be sudden with vomiting, acute abdominal pain, high temperature, and in both infants and children a markedly increased respiratory rate. Frequency of micturition or some dysuria may or may not be present. Frequently the child is drowsy with face flushed, eyes bright, and manner apathetic, suggesting typhoid. In others the increased respiration gives rise to a suspicion of pneumonia. In a third type the mental aspect—drowsiness and sometimes in severe cases, head retraction, delirium, and other symptoms of meningismus—give rise to a suspicion of meningitis. There may be tenderness in one or other loin and, if the pain persists, some enlargement of kidney may be felt; otherwise the condition suggests an acute appendicitis. In infancy the attack may be heralded by some upset of the bowels, such as diarrhœa. In older children constipation before or during the attack is of common occurrence. In two cases of this disease I have noted some enlargement of the spleen suggestive of a systemic infection, and in infants some general bronchitis or even a supervening broncho-pneumonia is not uncommon.

CHART 1 (CASE 1).



A = Date of identification of *B. coli* infection and administration of alkalies (pot. cit., 10 gr., four-hourly).

CHART 2 (CASE 2).



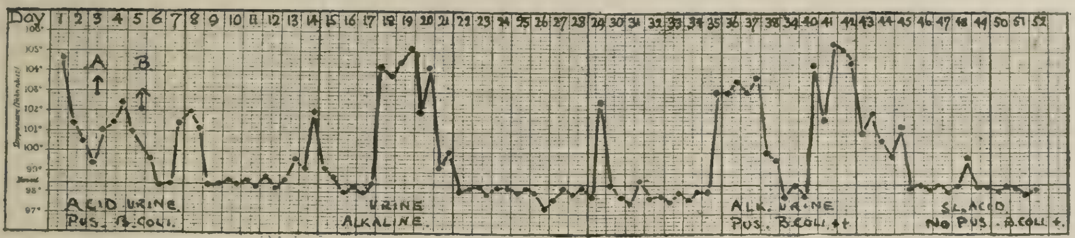
A = Diagnosis corrected to *B. coli* pyelitis; alkalies commenced. B = Dose of alkali doubled.

CASE 1.—A girl, aged 6 years, admitted with five days' history of pain in left side of abdomen, frequency of micturition, drowsiness, constipation, and fever; urine intensely acid, containing a trace of albumin, a quantity of pus, and *B. coli*. The chart exemplifies the continued fever type of the disease, abated on the eleventh day by administration of alkalies. Diagnosis: acute pyelitis. Recovery complete (Chart 1).

CASE 2.—A female infant, aged 10 months, admitted with cough, vomiting, and diarrhœa. On admission face flushed, respiration rapid, high temperature. Provisional diagnosis: pneumonia, which was rapidly disproved by complete freedom of lungs from physical signs and presence of albumin, pus, and *B. coli* in large numbers in the urine. Rapid recovery on alkaline treatment. Chart 2 illustrates confusion of disease with pneumonic states and shows rapid defervescence of temperature when large doses of alkalies (pot. cit. 30 gr., sod. bicarb. 20 gr.) were administered.

CASE 4.—Girl, aged 7½ years, admitted semi-conscious and delirious, with great mental irritability, and incontinence of urine and fæces. Tache cérébrale well marked, Kernig's sign, onset sudden. Sent to hospital as meningitis. Previous history of enuresis for two years, following a severe attack of whooping-cough. Urine acid, trace of albumin, pus cells, and *B. coli* in profusion. Chart 3 shows persistent recurrent fever in spite of treatment, and exacerbations whether urine is acid or alkaline. After ten weeks in hospital the child was discharged with urine free from pus and albumin, but *B. coli* were still present on cultivation. Two months later she was again readmitted with a recurrence of all symptoms and pus in the urine. The previous enuresis suggests a latent and long untreated chronic infection.

CHART 3 (CASE 4).



A = Alkali, 30 gr., six-hourly. B = 60 gr., four-hourly.

CASE 6.—Boy, aged 1 year, admitted with pneumonia. In the course of convalescence he developed a high temperature with rigors. Urine found to contain pus, albumin, *B. coli communis*, and *Staphylococcus aureus* and *albus* in large numbers. Complete recovery with alkalies.

The temperature chart in this disease is worthy of some further consideration. A series of charts herewith illustrate different types of the disease. In certain cases the disease may be apyrexical throughout, in others the fever is high and maintained, as in typhoid or pneumonia; in others the charts are distinctive of the disease, as in the "malarial" type, with signs which occur in infancy (Chart 6) or in the recurrent type of fever which is prevalent in the more chronic relapsing cases in older childhood (Chart 4). There is not one showing a condition of long-continued fever, but it is quite easy to imagine that such might be the case in at least one of these, if treatment had not abated the infection (vide Charts 1 and 2). The urine in both infancy and childhood in these cases of pyelitis is highly acid, contains a small quantity of albumin, a variable number of pus cells, and a profusion of organisms which exhibit the morphological and cultural features of *B. coli*.

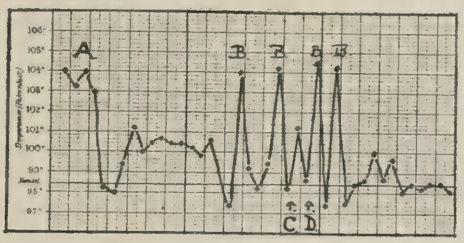
Evidence of infection of the kidney by *B. coli* is shown in some cases by profuse hæmaturia; in others the picture is identical with that of acute idiopathic nephritis; the urine being smoky, containing blood, pus, albumin, and rarely a few casts, and culturally *B. coli*. There may be some œdema and pallor in these cases, but more frequently there is no œdema and no evidence of anæmia. In a few rare instances suppuration occurs in the substance of the cortex of the kidney. These cases are fatal. In the only one I remember to have seen the symptoms were pallor, semiconsciousness, gradually increasing to coma and death. A diagnosis of meningitis had been made, but an examination of the cerebro-spinal fluid yielded neither any cellular increase nor pathogenic organism, while the urine showed pus cells and *B. coli*. Post mortem a number of small yellow abscesses were visible in the cortex. Such is a brief clinical picture of *B. coli* infection of the urine in infancy and childhood.

Bacterial Infections Complicating Other Diseases and also Giving Rise to Pathological Changes in the Urinary Tract.

We now come to our third group—namely, *B. coli* infection grafted on to some other disorder as a complication. While the diagnosis of a primary *B. coli* infection is not always easy, the addition of such to some other fever or disease often produces a most bewildering and confusing picture, and it should be remembered that the incidence of this disease during the course of other illnesses is no rare occurrence. Conditions which (1) lower the general resistance, or (2) in any way implicate the gastro-intestinal tract or cause abrasion of the latter, appear to facilitate the passage of *B. coli* from its intestinal residence to a fresh area in the urinary tract. Thus, on the one hand, we see it complicating the termination of an attack of pneumonia, as in Chart 6, and on the other the convalescence of typhoid. Whenever it happens the symptoms already mentioned follow or are merged with those of the original infection.

Probably the greatest difficulty will arise where a *B. coli* infection is implanted on some other kidney trouble or some malformation of the kidney. Recently I was asked to see an infant who had failed to gain in weight and suffered from recurrent attacks of diarrhœa and sickness, despite the most careful feeding. A temperature chart showed recurrent attacks of fever, not always coincident with the intestinal derangements, and in two of these attacks there had been definite rigors. Examination of the urine showed pus cells and *B. coli* and a trace of albumin; the child was of the usual pallid, fretful type which one associates with a prolonged *B. coli* infection, and as a consequence a diagnosis of pyelitis was made with some assurance and hope of successful recovery. Three or four weeks later, however, the child died in a state of uræmic convulsions, and post mortem we found double congenital hydronephrosis with a superadded *B. coli* infection.

CHART 4 (CASE 6).



A = Crisis of pneumonia. B = Rigor. C = Date of identification of *B. coli* infection. D = Beginning of alkali treatment.

Prognosis.

The next question that arises is, What is the ordinary progress of this disease and of what nature is the prognosis?

Cases of *B. coli* infection fall roughly into four groups: (1) Those having an initial acute attack which reacts to treatment with complete subsidence of symptoms and freedom from *B. coli* in the urine.

(2) Cases which recover from their initial attack, but though devoid of fever and constitutional symptoms continue to show the presence of *B. coli* in the urine. Such cases are liable to relapse and present acute symptoms again on any deterioration of health reducing their acquired immunity. (3) A recurrent chronic type, not reacting to treatment and not developing any immunity. Such cases drag on for months and years with variable periods of ill and good health. 4. Fatal cases, which are rare. In these there is, as we have already pointed out, renal suppuration. Such cases are resistant to treatment and gradually sink and die uræmic.

The prognosis in this disease depends, as in most medical disorders, on early diagnosis and efficient treatment. Delay in either one or the other tends to chronicity; once well implanted, this infection is exceedingly difficult to eradicate.

Treatment.

Treatment resolves itself into :—

1. Rest in bed.
2. Liquid diet with plenty of bland fluids.
3. Attention to the bowels. Correction of constipation, the arrest of any diarrhœa or morbid processes in the bowel, and the administration in any case of some regular intestinal antiseptic.
4. The exhibition of drugs, of which by far the most valuable are simple alkalies, such as pot. cit., sod. cit., or sod. bicarb. These must be administered in large doses; 10 to 15 gr. of the former can be safely given every two hours to an infant of 1 year for a short period, and then given four-hourly and six-hourly until all pus and *B. coli* have disappeared, or mixtures of pot. cit. and sod. bicarb. may be used. Continuation of this treatment is generally recommended until all constitutional symptoms have subsided and the urine is alkaline. Now I would state that subsidence of constitutional symptoms does not imply freedom from *B. coli* infection, and that alkalinity of the urine cannot always be attained, even with very large doses of alkalies by mouth—and that, moreover, despite alkalinity of the urine attacks of fever and recrudescences of the disease may still occur. The only real indication of cure is the absence of pus and micro-organisms from the urine. These points are well illustrated in the charts (see Chart 4). Occasionally large doses of alkalies are ill borne, and continued administration unquestionably in many cases produces lack of appetite, general depression, and even vomiting. They should, however, be pressed to the limit of tolerance, and may then be superseded by some urinary antiseptic, such as helmitol or urotropin. I have never seen any real benefit accrue from the use of these substances alone in this disease, except in the case of mixed infections. However, the alternative use of these drugs and alkalies seems at present the best procedure when the disease is protracted in its course.
5. Treatment by autogenous vaccines. With regard to this method, I have personally had very little success. In a few cases I have even believed I have seen harm done, and in the type of case, the chronic recurrent, where one most desires assistance, it has in my hands proved useless.

The question of mechanical interference, such as lavage of the bladder, is one to be carefully considered. In mixed infections this is possibly of value, but in the great bulk of cases and in all pure *B. coli* infections, instrumental treatment should be avoided. Whatever method of treatment is employed, every effort should be made to see that the urine is free from *B. coli* before such treatment and observation is discontinued. Many chronic cases, I am confident, arise from neglect of this simple precaution.

Diagnosis.

The diagnosis of this condition has been to some extent reviewed in discussing the symptoms to which it gives rise. Acute cystitis, due to the *B. coli* alone or to mixed infection of *B. coli* and streptococci, is generally readily recognised by the dysuria and frequency to which it gives rise, and the nature of the infection is readily discovered by microscopical examination of a catheter specimen of urine. Acute pyelitis, however, may give rise to some difficulty unless it is always remembered that unexplained fever in infancy or childhood may have its origin in a *B. coli* infection of the urinary tract. In many of these cases, as I have pointed out, there are few occasions in which the symptoms indicate irritation or inflammation of the pelvis or kidney itself. Where there is acute hæmaturia I have seen the diagnosis of stone made, or rarer conditions such as essential hæmaturia or scurvy, where a simple cultivation of the urine would have shown *B. coli.*

Acute cases with abdominal pain and fever and rapid pulse suggest appendicitis. Continued fever with some drowsiness and irritability suggest typhoid, general tuberculosis, or meningeal conditions. The same with increased respiration, so often seen in this disease, suggests a pneumonia, and I have no doubt that the diagnosis of deep-seated pneumonia is not infrequently made in this disease. A small apical pneumonia and this condition are easily confused, but a strict examination will reveal the first and a catheter specimen of urine the second. Where this condition complicates a pneumonia or arises in convalescence the most natural assumption is to attribute the fever to some empyema formation or an acute otitis media. In Case 6 the patient's chest was explored on more than one occasion on these grounds. Where there are rigors infective endocarditis or septic conditions may be inferred wrongly. The close similarity of the chart to malaria must be confusing in countries where that disease is endemic.

Where the fever is recurrent suspicion will arise of tuberculosis; glandular tuberculosis of the abdomen not infrequently presents a picture with this characteristic chart. Rheumatic and nervous children are liable to slight recurring bouts of fever without any very definite physical signs. Tonsillitis in deep-hidden tonsils gives rise to recurrent attacks of febrile disturbance with general malaise.

The mode of entrance of these various organisms, and in especial the *B. coli*, has aroused a certain amount of controversy. The old view was that in all cases infection was of an ascending nature via bladder and ureter to the kidney. The extreme prevalence of this disease in female infants and children was quoted as a proof of this method of ingress. On the other hand, although less common in males, it does occur in that sex, and direct invasion per urethram seems difficult of comprehension on anatomical grounds. Then it was stated that invasion along the ureter against the urinary flow was impossible; this, however, has been proved possible by experiment. It may be assumed, therefore, that in certain cases infection of the bladder at all events may take place from soiling of the vulva by fæces in young children, and it is possible that a secondary infection of the pelvis and kidney results, therefore, by direct spread, such spread being facilitated by possible inflammation of the bladder, obstruction of the ureteric orifice, and stagnation of urine in the ureter.

There are, however, a number of cases in which the predominant and apparently sole lesion is one of pyelitis or pyelonephritis; from these it has been assumed that there is a blood infection, the organism entering the blood-stream and selecting the kidney as its victim, owing presumably to some lowering of resistance of that organ. The general septicæmic state of some of these little patients and its close resemblance under certain conditions to an allied condition, typhoid, suggests that the blood-stream, therefore, is also a path of infection.

Lastly, we have the lymphatic theory of spread of infection; one path being by way of the lymphatics of ureter from the bladder to the kidney, and secondly, directly from the lymphatics of the large bowel to the lymphatics of the capsule of the kidney.

PULMONARY AMŒBIASIS.

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IN most cases amœbic infection of the lung is due to direct extension of a previously existing hepatic abscess through the diaphragm. Cases of this nature are well known, but their recognition at any early stage after rupture is necessary in order that specific and efficient treatment may be immediately installed. Abscess of the lung due to *Entamœba histolytica* can occur quite independently of abscess of the liver, though seldom recognised during the lifetime of the patient. It is with this aspect of pulmonary amœbiasis that I mainly wish to deal in the present paper.

In the older literature in the case recorded by Colin[1] in 1873, ten abscesses of the lung had arisen secondary to a thrombus in the liver, and in another reported by Moxon[1] the liver abscess had actually burst into a sub-hepatic vein, and thus spread to the lung. In this first condition, which may be termed primary pulmonary amœbiasis, the route by which the entamœbæ gain the pulmonary circulation is probably the one described by Bunting[2] (1906)—that is, by direct embolism through the circulation from the colon. In this case firm consolidated nodules were found in the lung in which entamœbæ were demonstrated in section. In another described by Opie[3] in 1901 a large amœbic abscess was found in the right lung, together with an evidently healed amœbic abscess of the liver. Tuffier[4] in his paper evidently recognised the condition during life, and the patient is reported to have been cured by operative interference. In this case the abscess was present in the right lung; hæmoptysis, fever, and other symptoms were present, but no assistance could be obtained from radiography in arriving at a diagnosis. Loison[5] reported a similar instance and suggested aspiration of the pus, the point of the needle being directed visually through a radioscopic screen, which in a radiographic report by Herold[6] seems actually to have been accomplished, for in the figure reproduced the outline of the abscess can be quite clearly seen below the angle of the right scapula. In this instance hæmoptysis was present and bodies were found in the sputum which resembled degenerate entamœbæ. The patient subsequently developed an hepatic abscess. Simonin[7] reports an autopsy in which two abscesses were situated in the right lung, quite separate and independent from three abscesses in the liver. Macfie[8] in Accra also has found amœbic abscess of the lung associated with a similar condition of the liver at autopsy. Quite recently Ramond,[9] Denoyelle, and Lautman have recorded an interesting case where multiple pulmonary abscesses without ascertainable involvement of the liver were recognised during life and where all symptoms disappeared after exhibition of emetine.

Primary Pulmonary Amœbiasis.

Three striking instances of what appear to be primary pulmonary amœbiasis caused by infiltration of the lung by *E. histolytica*, quite independent of liver abscess, have recently been met with in hospital practice. All three cases have responded in a dramatic and striking manner to emetine therapy.

CASE 1.—An ex-soldier had served in India during the war and had suffered from dysentery in 1918, with subsequent relapses treated with emetine (presumably amœbic in origin) was admitted into hospital on March 12th, 1921. He was then complaining of intermittent pain, acute at times, in the lower chest on the right side. For the last 14 days he had been troubled with cough, accompanied by fever and some respiratory distress; the number of respirations averaged 26–28 per minute. The sputum was profuse and purulent in character, but there had been no hæmoptysis. The patient was evidently ill, pallid, and emaciated, weighing 112 lb. Pyrexia was intermittent, varying between 101° and 102° F.; nocturnal perspiration was profuse. No clubbing of the fingers was noted, or any "shoulder pains."

At first hepatic abscess was suspected, as the patient had suffered from dysentery and there was a leucocytosis of 14,000; however, the fæces were frequently microscopically examined for *E. histolytica* cysts with a negative result. There did not appear to be any special involvement of the liver. In fact, the pain was situated above the hepatic area and pulmonary signs were sufficiently apparent. There was a patch of dullness to percussion, some 4 inches in diameter, below the angle of the right scapula when the breath sounds were bronchial and an occasional expiratory crepitation could be distinguished. Similar, but smaller, broncho-pneumonic areas became apparent from time to time after frequent examination at the lower lobe of the left lung. The sputum, which contained numerous pus and large epithelioid cells, was frequently examined for tubercle bacilli without avail.

In view of the possible involvement of the liver, the organ was aspirated without result; no improvement in the pulmonary signs were noted, and the pyrexia remained the same as before. The diagnosis then varied between a simple or tuberculous broncho-pneumonia and the consensus of opinion was in favour of the latter, and one month after admission and six weeks after the commencement his condition had become steadily worse. Purely on empirical grounds and the possibility of amœbic involvement of the lung, emetine injection (1 gr.), together with pulv ipecac. 10 gr., were commenced on April 11th, 1921. An immediate and striking improvement was noted (Chart 1); the pyrexia, which had persisted for the previous six weeks, resolved in four days; the broncho-pneumonic signs disappeared and the patient's general condition improved to such an extent that he was discharged on May 18th in apparent good health. He received altogether 260 gr. of pulv. ipecac. During the course of his acute illness he had become emaciated, and he rapidly regained weight up to 140 lb.—an increase of 28 lb.

CASE 2.—An ex-soldier, who had served in Mesopotamia, was admitted on May 10th, 1921, shortly after the discharge of the first case. He also had suffered from dysentery contracted in 1919 and had experienced numerous relapses, for which he had been treated with emetine. In August, 1920, during one of these relapses, he was admitted to the Hospital for Tropical Diseases with clinical signs of dysentery, and for which he was treated with emetine bismuthous iodide. No entamœbæ were found in the fæces, but the sigmoidoscopic appearances were characteristic of amœbic infection.

A fortnight after admission he commenced to suffer from pyrexial attacks with "shivering fits," broncho-pneumonic symptoms, nocturnal perspirations, profuse purulent expectoration, but again no hæmoptysis. Respiratory distress was evident and the number of respirations averaged 24 per minute. The patient's general condition was decidedly poor, perspiration was profuse and evident, emaciation extreme (weight 114 lb.), skin tense and dry, and the general condition of the patient and the remittent pyrexia (T. 102° to 103° F.) certainly suggested at first sight miliary tuberculosis. On examination numerous crepitations and fine sibilant rhonchi were apparent evenly diffused over both lungs. By light percussion small scattered and indefinite patches of dullness could be distinguished, but there was nothing to suggest any involvement of the liver. There was a slight leucocytosis of 9000; the fæces contained no *E. histolytica* cysts; the sputum numerous pus and epithelioid cells, but no entamœbæ (which were specially looked for).

Some three weeks after admission the general condition of the patient was worse, and the suggestion of miliary tuberculosis seemed to receive support. At this time definite rigors were noted, the temperature rising suddenly with profuse perspirations to 104° F. Two of these rigors occurred during a space of five days.

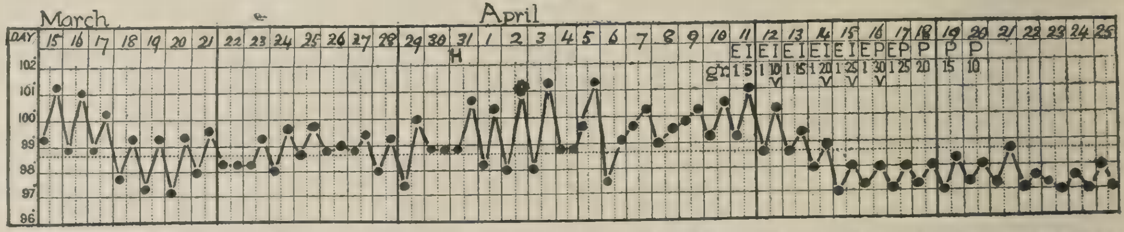
In view of the case already recorded, emetine injections were instituted, with immediate improvement in the clinical signs and in the patient's condition, as the chart shows (Chart 2). He received in all 16 gr. of emetine, followed by 300 gr. of ipecacuanha spread out in doses of 10 gr. each nightly. The improvement in the condition of the patient was so striking as to be apparent to all. His weight increased by 21 lb., and he was discharged on July 26th, 1921, in apparent perfect health. He has suffered from one similar relapse since, for he was readmitted a year later with similar but milder symptoms, which once more speedily yielded to emetine and ipecacuanha therapy.

CASE 3.—A lascar, aged 28, was admitted to the Albert Dock Hospital with a provisional diagnosis of broncho-pneumonia. As the chart indicates (Chart 3) he was in a very distressed condition—temperature 103° F. with orthopnœa, marked dyspnœa, and respiratory distress. The pulmonary signs were most evident at the right base, where a distinct friction rub, bronchial breathing, and crepitations indicated a consolidation of the lung. Within a few days similar signs were audible also on the opposite side. The sputum, which was abundant, purulent, frothy, and streaked with blood, contained pus and epithelioid cells, scanty pneumococci, but no T.B.

The patient's evident anæmia could be attributed to a concomitant ankylostome injection as the ova were present in the fæces. A high leucocytosis of 94,000 was present, and this figure seemed to indicate that in this case one was not dealing with either a tuberculous broncho-pneumonia or the usual type of broncho-pneumonia commonly encountered in this class of patient. There was slight thickening of the consolidated broncho-pneumonic nodules, I do not believe this to be possible. No assistance was obtained in aiming at a diagnosis by the X rays.

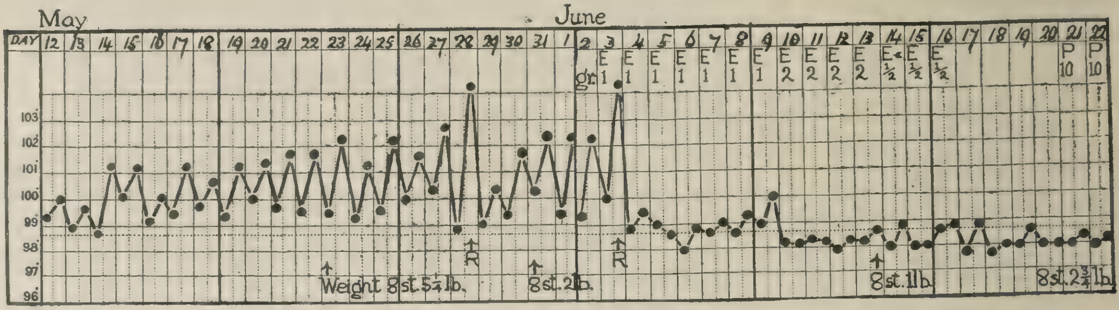
My object in publishing this paper is to bring these facts to the notice of tropical workers, as probably these cases are of more frequent occurrence than has been thought to be the case. It is possible that many of the obscure unresolving broncho-pneumonias in natives which one encounters in hospital practice, especially amongst lascars, are really of this nature.

Chart 1.



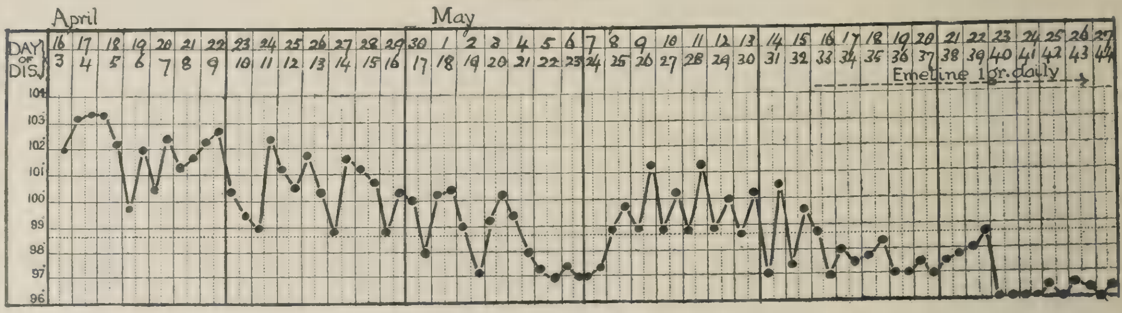
Case 1.—Showing resolution of pyrexia in four days after injection of emetine. H = hypodermic injection of influenza vaccine. E = emetine. I = ipecacuanha. P = pil-ipecac. V = vomiting.

Chart 2.



Case 2.—Another illustration of immediate improvement after institution of emetine treatment. R = rigor.

Chart 3.



Case 3.—A third striking example of the beneficial effect of emetine injections. The patient was previously in a very distressed condition.

sigmoid colon, but otherwise no evidence of a recent amœbic infection.

At the end of the third week in hospital, when treated on empirical lines, the condition had not in any way improved, and signs of a patchy pneumonic consolidation were present throughout both lungs; it was then decided to try the therapeutic effect of emetine (Chart 3), with instantaneous and striking effect. The results of this treatment (emetine 11 gr.), followed by a course of pulv. ipecac. 5 gr. daily for 14 days, appear to have been permanent. On July 7th he returned to his ship in good physical condition, having gained over 28 lb. in weight.

The diagnosis in these cases was arrived at by a process of exclusion, by their previous history of amœbic infection, by the marked leucocytosis, and by observing the instantaneous and almost miraculous effect of emetine therapy.

From an ætiological standpoint it would have been more satisfactory to have found *E. histolytica* in the sputum, but from the nature of the lesions, which probably, as in Bunting's case,[2] are composed of

Pulmonary Amœbiasis Secondary to Liver Abscess.

The bursting of an unrecognised liver abscess into the lung may produce the most varied pulmonary signs, and it is not surprising, when such an accident occurs, that the physician is led to diagnose various pneumonic conditions, such as bronchiectasis, tuberculosis, or unresolving pneumonia. It may happen that the original hepatic abscess produced no symptoms whatever, and therefore remained unrecognised till the rupture had taken place.

Case 4.—A regular soldier, a staff-sergeant in the R.F.A., first went to India in 1909. In December, 1914, he became ill with dysenteric symptoms, and phlebitis of both legs. Later he is said to have suffered from pneumonia, but the liver was aspirated under an anæsthetic, evidently on the suspicion that an abscess existed. In May, 1915, he was transferred to the United Kingdom and invalided out of the Service on account of continual pyrexia and recurrent attacks of phlebitis.

Apparently thrombosis of the veins began in the left leg, causing great pain and spreading via the pelvis into the right. Some three months subsequently compensatory enlargement of the abdominal veins was noted, which gradually formed a large abdominal plexus. He was unfit for service through the whole of the war, suffering from intermittent attacks of pyrexia and phlebitis and secondary ulceration. In February, 1920—i.e., five years and two months after original attack—pleuritic pains in the right side commenced with cough, profuse expectoration, often blood-tinged. The fingers became numb and cold and the terminal phlanges gradually became clubbed.

At that time he was thought to be suffering from pulmonary tuberculosis, and an unfavourable prognosis was given. Admitted to hospital on Nov. 8th, 1920, he was found to be in a distressed condition, harassed by constant cough, expectoration, and pain in right side. The temperature was hectic in type, emaciation was extreme, and the sputum was profuse, frothy and purulent, tinged from time to time with dark blood. In amount it varied from one to three pints in the 24 hours. This expectoration was usually brought up after an explosive coughing fit, and excited by change in posture; it was noted that bending to the left side was apt to initiate such a spasm. The clubbing of the fingers and toes was evident, and the superficial abdominal veins were varicose.

No evident enlargement of the liver was revealed by a physical examination, but the signs elicited on the right side suggested a considerable involvement of the lung tissue. Impairment of percussion, with diminished air entry and vocal resonance, extended downwards from the third rib. Posteriorly dullness commenced from the seventh space in the scapular line. The sputum contained numerous pus and large epithelioid cells; there was a definite leucocytosis of 14,000, while the fæces contained the cysts of *E. histolytica* in large numbers.

The liver was aspirated under an anæsthetic without result; immediate improvement took place from emetine and ipecacuanha therapy; the cough diminished; the expectoration became less in amount and the lung signs cleared up entirely. The clubbed fingers and toes gradually became normal. He received a total amount of 10 gr. emetine, 160 gr. pulv. ipecac., and 30 gr. emetine bismuthous iodide. After two months in hospital he was discharged as convalescent, having made a satisfactory recovery, with no pulmonary symptoms, and having increased 18 lb. in weight. The sequence of events in this remarkable case would appear to be as follows:—

Primary amœbic dysentery; amœbic hepatitis and formation of hepatic abscess, septic absorption from the abscess cavity and consequent thrombosis of the saphena veins, compensatory venous circulation; rupture of hepatic abscess through diaphragm into right pleura, formation of secondary amœbic abscess of lung, with clubbing of fingers and toes, and respiratory changes.

This man has remained in good health ever since.

CASE 5.—An Englishman, long resident in India, returned to this country on leave in May, 1921. He had been suffering from antral trouble for some time previously, but the present illness began suddenly on August 9th of that year, with what was thought to be an attack of pneumonia. His temperature was intermittent in type, reaching 103° F., profuse perspirations, and the sudden expectoration of purulent fluid containing a considerable amount of dark blood. He became rapidly emaciated and lost over 2 st. in weight, the lowest recorded being 8 st. 13 lb. The amount of expectoration varied very considerably from day to day, apparently being influenced by posture. On admission to hospital on Oct. 10th he was found to have very considerable involvement of the right lung, with a pleuritic rub and diminished air entry; there was also impairment of the percussion note at the left base with sonorous rhonchi and scattered crepitations. The sputum was copious and purulent, averaging about a pint daily and containing large numbers of pus and epithelioid cells, no entamœbæ, but large numbers of yeast cells and branching mycelium. The organisms, cultured by Dr. J. T. Duncan, were found to have the characteristics of the genus monilia, and to be serologically similar, as tested by agglutination and complement deviation, to stock cultures of the thrush fungus. They are of the type commonly isolated by this investigator from fæces. The liver was not apparently enlarged, nor could any evidence of its implication be obtained from an X ray examination. The blood showed a definite leucocytosis of 12,000. The fæces contained no *E. histolytica* cysts. The improvement on emetine injections and pulv. ipecac. was rapid and remarkable, the amount of sputum diminished, and before he left for India in March, 1922, he had gained 47 lb. in weight. He has remained in good health ever since.

The hepatic abscess in this case must have been in the process of formation for some considerable time without producing any obvious symptoms; in fact, its rupture into the lung substance appears to have been the first evidence of its existence. The presence of yeast cells and mycelium in the sputum in large numbers, apparently derived from the lung cavity, is of interest.

One cannot regard the thrush fungus as the cause of the disease, but as being a secondary infection. In a similar manner Monilia often occurs in the sputum of tuberculous subjects, and other debilitated subjects. That this is not the view held by all may be judged by the amount of literature devoted to the condition described by Castellani as tropical bronchomycosis or bronchomoniliasis,[10] about the pathology of which little appears to be known. Castellani says that "the diagnosis of moniliasis is based on the finding of the fungus in the sputum." Adopting this criterion, the case quoted above should have been regarded as a primary infection of the lung with Monilia, and not as a case of pulmonary amœbiasis, as it turned out to be

Conclusions.

1. Pulmonary amœbiasis may develop independently of hepatic abscess.
2. The pulmonary condition may simulate those of a bronchopneumonia or miliary tuberculosis.
3. The diagnosis is based upon the previous evidence of amœbiasis, the leucocytosis, and the remarkable and lasting response to emetine and ipecacuanha.
4. Rupture of a hepatic abscess into the lung may take place without previous warning or the coexistence of hepatic symptoms.
5. The resulting pulmonary infection may closely resemble idiopathic disease of the lung, such as tuberculosis or bronchiectasis, both in local signs and general effects.
6. The therapeutic action of emetine and ipecacuanha is as striking in this as in the first condition described and, as generally recognised, is more rapid and lasting than in amœbic infections of the bowel.
7. Secondary infection of the respiratory tract with yeast fungi (Monilia) may occur (so-called bronchomoniliasis). This appears to be of little diagnostic and possibly of no ætiological importance.

I am indebted to Dr. J. T. Duncan for his help in the investigation of these cases, and to my senior colleague, Dr. G. C. Low, for his kindness in permitting me to utilise his notes of the third case quoted. Capt. R. L. Sheppard has given me considerable assistance with the scattered literature of this subject.

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GASTROMYOTOMY:

AN OPERATION FOR THE CURE OF CHRONIC ULCER OF THE STOMACH.

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Gastro-enterostomy for the cure of gastric ulcer is out of favour, whether alone or combined with excision or cauterisation of the ulcer. Sir Berkeley Moynihan,[1] in a recent Hunterian Lecture, has stated that its "trivial advantages" are outweighed by its disadvantages, the chief of which is that the relief that follows the operation is frequently only temporary. Most surgeons will agree that the operation is by no means ideal for ulcers in that situation, and will admit the force of the arguments that he brings forward in his advocacy of the very radical operation of partial gastrectomy. The surgical mind, however, cannot contemplate with perfect satisfaction the necessity of having to choose between medical treatment on the one hand and gastrectomy on the other. If no less hazardous and mutilating operation can be devised for the cure of these ulcers, the inevitable tendency will be to postpone surgical intervention and to try medical treatment for longer than would otherwise be the case. But surgeons will continue to search for a simpler and safer operation, bearing in mind, perhaps, that if they can, by such an operation, bring about "a complete subsidence of all symptoms, a permanent freedom from any recurrence of the like disease, and immunity from any disorder associated with the operation"[1] in a *majority* of the cases, the operation of gastrectomy still remains for those few, if any, in whom the symptoms are not relieved or recur. For the operation about to be described it is claimed (1) that it is based on sound physiological principles; (2) that it may fairly be described as a safe and a simple operation; (3) that the results in the few cases in which it has been performed have been good.

The principles on which the operation is based may first be considered.

Cause of the Chronicity of Gastric Ulcers.

Leaving aside the question of the actual origin of gastric ulcer, there is general agreement on three points in connexion with the subject: first, that chronic ulcers are found, in the great majority of cases, in two situations only—on or near the small curvature and on or near the pylorus—while acute ulcers are not so limited in their distribution; secondly, that healing of gastric (and duodenal) ulcers is a common event (Prof. M. J. Stewart[2] has brought forward conclusive evidence on this point from post-mortem examinations); thirdly, that there is no known reason, anatomical or physiological, why ulcers should *originate* in one part of the stomach more than in another. We may draw the inference, therefore, that there is some factor in connexion with the small curvature and the pylorus that delays or prevents the healing of ulcers near these parts. I believe that this factor is to be found in the arrangement of the circular muscle fibres in these parts. In the case of the pylorus there is an easily demonstrable sphincter; in the lesser curvature, the circular fibres that are comparatively thinly spread over the fundus and the great curvature are crowded into a smaller space and set so close together as almost to constitute a sphincter. It is a fundamental principle of pathology that rest is conducive to the healing of a wound, while movement and irritation hinder healing. While no part of the stomach is at rest for any length of time, unless feeding by the mouth is discontinued, and probably not even then, an ulcer originating in a part where the muscle fibres are sparsely distributed, such as the great curvature, has a much better chance of healing than one which happens to start in the sphincter of the pylorus or the small curvature. A fissure of the anus involving the sphincter ani heals slowly, perhaps not at all; when the muscle is divided the fissure heals rapidly, in spite of the septic nature of the material that passes over it. It occurred to the writer that treatment on these lines might allow natural healing to take place in chronic ulcers of the stomach, and that it might prove more profitable to focus attention on the muscular fibres rather than on the gastric juice or on dental sepsis. The operation consists of a division of the circular muscle fibres that pass to the neighbourhood of the ulcer. "Gastromyotomy" seemed a convenient and self-explanatory name for the operation.

Technique of the Operation.

I have performed gastromyotomy only in cases where laparotomy has revealed a chronic indurated ulcer of moderate size in the neighbourhood of the small curvature, uncomplicated by hour-glass contraction and not adherent to the pancreas, though I am not sure that the latter complication would contraindicate the operation. If the ulcer is on the anterior wall of the stomach, a curved incision, about four inches long, with the convexity downwards, is made below the ulcer and sufficiently far from it to be free of indurated tissue; this incision divides the peritoneal coat only. The peritoneum is separated from the muscular coat for about a quarter of an inch on each side of the incision, and the muscle fibres are defined. The incision is then carried down to the muscularis mucosæ, thus dividing all the circular muscle fibres passing to the ulcer-bearing area. This part of the operation is a little difficult, as the fibres are sometimes indistinct and it is easy to penetrate the mucous membrane; should this occur it is sutured before proceeding. The divided muscle fibres are now separated on either side of the incision by means of gauze wiping, and the peritoneal coat sutured by Lembert sutures in such a way that the cut edges of the peritoneum are inverted into the gap that has been made in the muscular coat. I have once or twice cauterised and infolded the ulcer, but am not convinced that there is any particular advantage in so doing. After the usual inspection of the appendix, &c., the wound is then closed. Where the ulcer is on the posterior wall I have exposed the stomach through an opening in the mesocolon and made the incision in the posterior wall of the stomach; but as the muscle fibres appear to be thinner in that situation than in the anterior wall, I have made the anterior incision as well, thereby practically isolating the ulcer as far as the circular muscle fibres are concerned.

As regards after-treatment, patients have been treated much in the same way as those in whom gastro-enterostomy has been performed—salines and glucose for 24 hours, feeds of milk, &c., going on to fish and minced chicken in about a week, and ordinary food soon after. Alkalis have not been given.

Results.

In no case has there been any pain after the operation, nor any vomiting, apart from slight post-operative vomiting. In one patient, in whom even feeds of milk caused pain up to the day of operation, the pain entirely disappeared and has not recurred, though she has been taking ordinary food with good appetite for some months. This has been perhaps the most striking case, for in the other cases careful dieting and medical treatment combined with rest in bed had relieved the pain for a week or so before operation. In one patient, who was markedly anæmic from gastric hæmorrhage, the melæna, which disappeared immediately after the operation, recurred and did not entirely clear up until the twelfth day. In this case the base of the ulcer was very thin and was cauterised and infolded; some leaking apparently occurred and the upper part of the wound suppurated for a few days. There has been no pain or vomiting since the operation and six months after discharge the melæna has not recurred.

One patient complained of occasional attacks of vomiting a month after operation, but in her case permission to take ordinary food was too liberally interpreted, and vomiting has ceased since reasonable care has been taken in the selection of diet. In one case I had occasion to reopen the abdomen two months after performing this operation. The patient was a man of 37, with a three months' history of pain one and a half hours after food, and two recent attacks of hæmatemesis. There was a large ulcer in the anterior wall of the stomach, close to the small curvature and at the junction of the cardiac and pyloric parts of the stomach. There was so much induration around the ulcer that I was suspicious of malignancy, but decided against it. Gastromyotomy (anterior wall only) was performed and for eight weeks there was no pain after food, and the man improved remarkably in general condition and put on weight. He then began to complain of pain, not related to food, but coming on at night; there was considerable delay, one-third of the meal remaining after eight hours, and I began to think that I had made a mistake in not treating the condition as malignant. I reopened the abdomen and found that the extent and degree of the induration had greatly diminished and no longer suggested malignancy; the crater of the ulcer, however, could still be felt, although it was smaller and smoother than at the first operation; there was no sign of any scar where the muscular coat was divided at the first operation. Gastro-enterostomy was performed because of the delay. In an almost exactly similar case, where division of the muscular coat was carried out in both anterior and posterior walls, the result after six months is most satisfactory, and I am inclined to think that the division of the fibres on both sides of the ulcer will prove to give better results than on one side only.

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[1] The Lancet, 1923, i., 221.

[2] The Lancet, 1922, ii., 1164.

Rôle of Gastro-enterostomy in Gastric Ulcer.

There is no doubt that the results of gastro-enterostomy for gastric ulcer are frequently very good, though symptoms are apt to recur. Some attribute the beneficial effects of the operation to the neutralisation of the acid gastric juice by the alkaline contents of the duodenum which flow into the stomach through the stoma, while others, including Moynihan, consider that the mechanical factor, the simple drainage of the stomach, is the chief effect of the operation, the rapid emptying of the stomach affording rest to the ulcer and so facilitating healing. The performance of gastro-enterostomy, however, introduces a third factor to which I believe attention has not hitherto been directed, but which I venture to suggest has an important bearing upon the results of the operation. This factor is the abolition of the sphincter action of the circular muscle fibres divided by the incision from which the stoma is made. If these fibres are those that pass to the ulcer and its immediate neighbourhood, the ulcer is placed at rest, as far as the circular fibres are concerned, though it may still be dragged upon by the longitudinal fibres, which are set close together along the small curvature. Not only are the fibres divided; they are, by the anastomosis, prevented from ever uniting again. An incision that will divide all the fibres passing to an ulcer on the small curvature will clearly have to be considerably longer if it is placed near the great curvature than if it is nearer the ulcer. For an ulcer of moderate size it will have to be of considerable length, and this perhaps may be the explanation of the fact that a large stoma gives better results than a small one, even though the latter is larger than the normal pyloric opening. That drainage of the stomach alone is not sufficient to cause healing was shown by Fibich,[8] who drained by a narrow tube the stomach of dogs in whom chronic ulcers had been artificially produced; the ulcers did not heal, though they healed readily after gastro-enterostomy.

I suggest, therefore, that the operation of gastro-enterostomy, when performed for ulcers of the small curvature, or of the anterior or posterior wall near the small curvature, is, in effect, simply a "gastromyotomy," that the drainage of the stomach and the neutralisation of the gastric juice are not the important factors, and that what the operation really succeeds in doing is to put out of action some at least of the muscle fibres that pass to the ulcer. If there is any truth in this view a much simpler operation should suffice. It is only necessary to divide the muscle fibres and to prevent them from uniting too quickly and the same result will be produced. In the operation that I have described the curved incision, fairly close to the ulcer, divides all the fibres, circular and longitudinal, that pass to the ulcer, and is shorter than an incision at the great curvature would have to be to divide only the same circular fibres.

We have no certain knowledge concerning two points in connexion with the operation of gastromyotomy. First, the length of time required for healing to take place in an ulcer immobilised by section of muscle fibres; secondly, the length of time before the divided fibres unite and function is restored. As regards the first point, Eve reported a case where he has performed gastro-enterostomy for an ulcer in the pyloric part of the stomach associated with considerable inflammatory thickening; laparotomy had to be performed five weeks after the first operation, and it was found that the ulcer had completely disappeared, its site being indicated merely by an omental adhesion. Several somewhat similar cases have been reported. It may, therefore, be taken that, under the most favourable circumstances, complete healing may be a matter only of a few weeks. It may be mentioned that the most favourable conditions are not necessarily secured by keeping the stomach empty and feeding the patient through a tube in the jejunum, for the gastric muscles probably contract, either tonically or rhythmically, even when the stomach is empty; it is doubtful, for example, if an anal fissure could be made to heal by performing colostomy and leaving the sphincter ani intact.

Pyloric Ulcers.

Though it is true, as Sir Berkeley Moynihan points out, that ulcers involving the pylorus have their origin on one side or other of the sphincter and are either gastric or duodenal, nevertheless there is a certain appropriateness in the designation "pyloric" as applied to these ulcers. For, if it is true, as I believe, that it is the invasion of the muscular coat by these ulcers that is responsible for the delay in healing, then the significant thing about an ulcer in this situation is not whether it has originated on one side or the other of the pylorus, but the fact that it has actually invaded the muscular fibres of the pylorus, and is therefore disturbed and irritated by every wave of contraction that passed through these fibres. With the object of setting the ulcer at rest, I have on several occasions in the last few years, in cases of pyloric ulcer, divided the pylorus down to the mucous membrane in addition to performing gastro-enterostomy; the peritoneal coat was united, leaving, as far as possible, the muscle fibres ununited. The cases, however, have been too few to enable one to say whether the step was of any particular value.

During the last six months I have treated four cases of duodenal ulcer involving the pylorus by simple division of the circular fibres without gastro-enterostomy. Though the results have been good and all symptoms have disappeared, I am not entirely convinced by them, and am certainly not prepared, without further experience, to claim that this operation is suitable for all cases of duodenal ulcer. My reasons for hesitating to draw conclusions from these four cases are first, that though the symptoms were definite enough, the ulcers were in each case small, and only indicated by slight scarring on the peritoneal surface without thickening and by slight omental adhesions; secondly, that the muscular coat of the duodenum is so thin and ill-defined that it is difficult to identify it and to separate the peritoneal coat from it, and consequently one is uncertain whether in suturing the latter some of the muscle fibres have not been included. If this should happen, union would presumably take place too soon to allow of a sufficiently long period of rest for the ulcer to heal. Where there is actual stenosis of the pylorus obviously gastro-enterostomy is necessary.

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[8] Langenbeck's Archives, 1906, lxxix.

Musculature of the Stomach.

Radiologists have taught us that the stomach may be divided into two parts—a "cardiac sac" where peristaltic action is sluggish, and a pyloric part where it is very active. The arrangement of the muscular fibres shows that there is an anatomical basis for this division. The circular fibres are only truly circular in the pyloric part of the stomach and to the left of the cardiac portion; in the greater part of the cardiac half they are U-shaped, and so incapable of acting as true sphincters. From the incisura angularis to the pylorus the circular coat is well marked, and strong peristaltic waves pass along it from the time that food enters that part of the stomach from the cardiac sac until the stomach is empty. Furthermore, there is at the incisura a sphincter (physiological only, according to Starling), called by Sir H. M. W. Gray the "sphincter aditus vestibuli,"[4] whose function appears to be to confine the food in the cardiac sac until it is ready to pass into the pyloric pouch. The longitudinal fibres constitute the external coat and are set closer together along the small curvature than elsewhere, while the oblique fibres are distributed chiefly over the fundus and the cardiac sac. Chronic ulcers are found most commonly in the pyloric half of the stomach, and generally nearer the small curvature than the greater, and I suggest that this distribution is due, not to a greater liability to acute ulceration in these parts, but to the fact that the greater activity of the muscles tends to prevent healing of ulcers sufficiently deep to have involved the muscular coat; while the comparative freedom of the cardiac sac (except near the incisura) from chronic ulcer is due to the less vigorous and less prolonged peristaltic action in that part.

Both W. J. Mayo[5] and Sir H. M. W. Gray[4] have pointed out the importance of performing gastroenterostomy in the pyloric half of the stomach, though for different reasons; Mayo, for the reason that much of the food passes over the stoma if it is placed in the cardiac half, while Gray believes that it is important to conserve the functions of the cardiac sac and drain the pyloric half in order to obviate the ill-effects of pyloric spasm. I suggest that the benefits arising from making the stoma in the pyloric half are due to the fact that the circular fibres passing to the ulcer are divided and kept apart by the anastomosis, the sphincter action of the fibres being thus abolished, and to the fact that drainage of the stomach is not the essential factor, and is, indeed, probably unnecessary. The operation that I have described is an attempt to apply to ulcers of the stomach the great principle of surgery that rest is the most important factor in the healing of wounds. I have performed the operation in nine cases in the last eight months; the number is too small, and the time since operation too short, for the results alone to carry conviction. I mention them to support a view of the pathology of chronic ulcer of the stomach that I believe to be worthy of consideration. Whatever may be the ultimate results of the operation in these cases, it can certainly be said that the immediate results have been satisfactory. In all the cases there had been typical epigastric pain for months or years, all had been treated medically for some considerable time without lasting benefit, and in the gastric cases in each case the ulcer was large enough to admit the tip of the little finger. In one case only has there been any pain since operation; all the patients have been taking ordinary food and have put on weight. In one case of ulcer of the anterior wall, though pain and vomiting had ceased, some loss of weight was observed four months after operation, and it was discovered that she had diabetes, which was not present at the time of operation. Gastromyotomy is a simple and safe operation, and, I believe, only temporarily affects the functional activity of the stomach, but it need hardly be said it is not applicable to cases where there is stenosis or hour-glass contraction, or anything but a simple ulcer. For an operation so free from risk, from which convalescence is so rapid (as indeed is the case in most gastric operations), and which offers a good prospect of complete recovery, with the preservation of the normal physiology and anatomy of the stomach, I think we may fairly hold the view that even if there should turn out to be a small proportion of recurrences, the operation is not condemned thereby. More radical measures are still available if the ulcer should recur.

Gastromyotomy is the link between medical and surgical treatment; the aim of medical treatment is to encourage healing by diminishing functional activity and so resting the stomach; the operation secures rest by putting out of action for a time the actual muscle fibres whose contractions irritate the ulcer. All that I could claim for this operation, and more, might be expressed by saying that if at the time when the "Lectures on Rest and Pain" were written gastric ulcer had been a surgical condition, such a view of its pathology as I have tried to bring forward, and perhaps such an operation as the above, would have appealed to John Hilton.

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[4] The Lancet, 1908, ii., 551.

[5] Collected Papers of Mayo Clinic, 1914.

ALKALI DEFICIT* IN NEPHRITIS.

By JOHN R. MARRACK, *D.S.O.*, M.D. Camb.

(From the Hale Clinical Laboratory, London Hospital.)

On ordinary diet, as a result of oxidation of neutral sulphur and phosphorus in the food to form sulphuric and phosphoric acids, and of the formation of organic acids, an excess of non-volatile acids arises daily, equivalent to about 500 c.cm. of N/10 solution, which should be excreted by the kidneys. When the kidneys are inadequate for this task retention of acid occurs, just as retention of urea occurs when the kidneys are unable to excrete urea as fast as it is formed. Because as a general rule, on ordinary diet, the kidneys are presented with an excess of acid to excrete, alkali deficit is more common than alkali excess in untreated cases of nephritis.

Methods for Detection of Alkali Deficit.

Many methods have been used for detecting the presence of alkali deficit; of these the most satisfactory is the estimation of the bicarbonate content of the plasma, preferably together with the hydrogen-ion concentration of the plasma. This gives direct information as to the actual balance of acids and bases in the blood, and indirectly in the other body fluids also. When the respiratory centre, heart, and lungs are carrying out correctly the regulation of blood reaction by control of CO_2 excretion, the CO_2 tension of alveolar air gives the same information, but in nephritis this regulating mechanism may be profoundly disturbed by interference with the blood-supply of the respiratory centre, heart failure, and œdema of the lungs, and the alveolar air becomes an unsatisfactory index of the condition of the body fluids.

Any method that depends on titrating the serum or plasma to an end-point distant from that of plasma, as, for example, to the yellow-red changing point of methyl orange, the agglutinating point of red blood corpuscles, or the iso-electric point of serum globulin, are fallacious, as they involve titration of the proteins of the plasma or serum. The factor thus introduced is variable, as the protein content of the plasma varies, especially in nephritis. When the kidneys are damaged it is obviously impossible to use them as indicators of the state of the blood and other body fluids, as they may excrete an alkaline urine when the blood contains an excess of acid, or vice versa. For this reason the method of alkali tolerance—the determination of the amount of sodium bicarbonate, given by the mouth, required to make the urine alkaline—though very unsatisfactory when the kidneys are healthy, is entirely fallacious in nephritis; in this condition it is no more justifiable than would be an attempt to titrate an acid with a faulty indicator.

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* Owing to the confusion that has arisen as to its meaning, the familiar term "acidosis" has not been used for the condition in which an absolute or relative excess of non-volatile acid in proportion to alkali is present in the blood; Van Slyke's term "alkali deficit" is used instead. The term "acidæmia," recommended by the Medical Research Committee, is not suitable, as it is defined as an increase in the hydrogen-ion concentration of the blood, which may or may not accompany alkali deficit.

The results of plasma bicarbonate determinations are usually expressed as the number of c.cm. of CO_2 that the bicarbonate in 100 c.cm. of plasma would give off on treatment with excess of acid, although this method of expression is undesirable, as in order to determine the effect of the retention of a given amount of acid on the plasma bicarbonate it is convenient to have both expressed as gramme equivalents per litre. The normal figures for plasma bicarbonate expressed in the customary manner range between 55 and 70. Cases of alkali deficit may conveniently be classified into mild with plasma bicarbonate between 45 and 54, moderate between 35 and 44, and severe under 35. In the more severe cases the increased lung ventilation fails to keep down the dissolved CO_2 in the plasma in proportion to the reduced plasma bicarbonate, with the result that the hydrogen-ion concentration of the plasma rises; this, however, does not occur in the less severe cases.

In the more severe cases of alkali deficit, in interstitial nephritis at any rate, some one-sixth to one-half of the reduction of plasma bicarbonate is accounted for by retained phosphoric acid; other acids, sulphuric among them, account for the remainder. The condition does not develop rapidly. Thus a patient who had had an extreme degree of alkali deficit and renal incompetence was given sodium bicarbonate, and her plasma bicarbonate brought back to normal; after the alkali administration had been stopped her plasma bicarbonate fell from 51 to 41 in a week; the patient was taking little carbohydrate, so that the acid production from the oxidation of protein must have been large.

Incidence of Alkali Deficit in a Series of Cases.

The incidence of mild, moderate, and severe alkali deficit in 216 examinations of patients who had not been treated with alkalis, arranged according to the height of the blood-urea, are shown in the table.

Showing Incidence of Alkali Deficit in a Series of Cases Arranged According to the Height of their Blood-urea.

—		Blood-urea in mg. per 100 c.cm.		
		Under 50.	50–100.	Over 100.
Total number of estimations		102	60	54
Alkali deficit	Mild	3	9	12
	Moderate ..	1	3	9
	Severe	0	1	13
	Of all degrees ..	4	13	34

In the one instance of a moderate alkali deficit with a normal blood-urea the patient had been having fits with clonic contractions for some hours, and the alkali deficit was probably, in part at least, due to accumulation of lactic acid. The three patients with mild alkali deficit in this group were all recovering from acute nephritis.

It appears from this table that alkali deficit is rare in patients with fairly efficient kidneys, and frequently, but not invariably, present in patients with severe kidney inefficiency. The higher incidence found by other methods is due to faults mentioned above. The severity of the condition is further shown by the death-rate; of seven patients with moderate alkali deficit four died within two weeks; of 14 with severe alkali deficit five died within a few days and five more within a month.

Associated Conditions.

As may be expected, alkali deficit and uræmia are frequently associated, but the alkali deficit itself seems to play no part in causing any of the symptoms of uræmia. Uræmia often occurs in patients with normal plasma bicarbonate, and is absent in others with severe alkali deficit; while patients in whom the plasma bicarbonate has been brought back to normal from a very low figure and maintained about normal may, after the lapse of some days or weeks, develop uræmia. Dyspnœa is very rare with alkali deficit in nephritis; hyperpnœa may be present, but is usually not striking. Actual dyspnœa and Cheyne-Stokes breathing occur rather in patients with arterial degeneration or some degree of heart failure, and are due to disturbance of the blood-supply of the respiratory centre. Headache and vomiting are no more common in patients with alkali deficit than in those without; in fact, the striking feature is the small effect that even an alkali deficit with increased hydrogen-ion concentration has—which fact supports the now generally accepted theory that the symptoms observed in diabetic ketosis are due not to the alkali deficit per se, but to the nature of the acids retained, and enforces the undesirability of confusing the terms "acidosis" and "ketosis."

Treatment.

Unlike other disturbances in severe nephritis alkali deficit is amenable to treatment, and treatment of the more severe degrees is certainly advisable, as the body will not stand more than a certain increase in the hydrogen-ion concentration of the body fluids, and as the bicarbonate falls the change in hydrogen-ion concentration produced by a given increase of retained acid steadily rises. On the other hand, the urgency of the need of alkali is not so great as to demand such emergency methods as intravenous injection, as there is not the rapid production of acid such as may take place in ketosis, and enough alkali can be given by the mouth to neutralise any fresh acid that may be formed and leave an excess for increasing the plasma bicarbonate. Rectal administration should not be employed, as it is impossible to form an accurate estimate of the amount absorbed.

The oral administration of sodium bicarbonate by the mouth has its dangers. Nephritics are unable to get rid of an excess of alkali as well as an excess of acid, and if excess is given a condition of alkali excess is produced, a condition more dangerous than alkali deficit, although it tends to cure itself if alkali administration is stopped. For this reason the amount of bicarbonate given should not be more than required to bring the plasma bicarbonate back to normal. Also the administration of large doses of sodium bicarbonate alone is liable to upset the balance between sodium, potassium, and calcium in the body fluids; for this reason potassium and calcium should be given at the same time. Calcium administration is all the more necessary as plasma calcium is often low in nephritis with alkali deficit. Again, administration of large doses of sodium bicarbonate often leads to increased retention of water, and increases œdema and the danger of œdema of the lungs; this provides further reason for keeping the amount given as low as possible. It is therefore desirable to give about as much sodium bicarbonate as will bring the patient's plasma bicarbonate up to 40; this removes the danger of the development of a fatal hydrogen-ion concentration. The amount required to do this can be calculated from the formula $g = W\ (40 - x)\ /2$, where x is the patient's plasma bicarbonate before administration, W his weight in kg., and g the number of grains of sodium bicarbonate required. With this should be given $\frac{g}{20}$ gr. potassium bicarbonate, and calcium lactate. Having brought the plasma bicarbonate up to this level, the production of acid should be kept as low as possible by feeding the patient on a mainly carbohydrate diet to reduce the production of acids from food protein or from the patient's own tissues to a minimum, and moderate doses of sodium bicarbonate—e.g., 20 gr. three times a day—should be given. Such treatment will not prevent the patient from dying from other causes; it may not prolong life, but it removes the risk of death from uncompensated alkali deficit.

Illustrative Cases.

The following cases illustrate points considered in this paper:—

CASE 1.—Severe alkali deficit; death probably accelerated by administration of large doses of sodium bicarbonate.

Female, aged 17, subacute parenchymatous nephritis. Œdema of arms and legs began in June, 1922. On Jan. 26th, 1923, general œdema; systolic blood pressure, 170 mm.; no cardiovascular hypertrophy. Urine scanty, albumin ¼ volume, granular casts. Red blood corpuscles, 1·4 million per c.mm.; Hb, 35 per cent. On the 27th plasma bicarbonate, 21; pH, 7·3; blood-urea, 320 mgm. per 100 c.cm. Mind clear; no hyperpnœa. On the 29th 1 dr. sodium bicarbonate, with proportionate amounts of potassium bicarbonate and calcium lactate, given every three hours. Gained 29 oz. in weight during next 24 hours, although she had, since admission, been losing weight. Died on evening of the 30th.

Post-mortem Examination.—Subacute lipoid parenchymatous nephritis; slight cardiovascular hypertrophy; very great œdema, and considerable congestion of lungs; general œdema.

CASE 2.—Severe alkali deficit; onset of uræmia after the acidosis had been somewhat reduced. Female, aged 17, out of sorts for seven months. July 18th, 1922, very slight œdema; blood pressure 162 mm. systolic, 80 mm. diastolic; bleeding from gums. On the 20th mind quite clear; slight dyspnœa on speaking much. Red blood corpuscles, 2·5 million per c.mm.; Hb, 35 per cent. Urine: albumin ⅓ volume; deposit pus. Plasma bicarbonate, 16; pH, 7·2; blood-urea, 320 mg. per 100 c.cm. On the 21st 500 c.cm. 2 per cent. sodium bicarbonate given intravenously; and ½ dr. by mouth every four hours. On the 22nd plasma bicarbonate, 28; pH, 7·4; blood-urea, 320 mgm. per 100 c.cm. General convulsions and coma, with intervals of consciousness, set in at 2 P.M.; later coma became continuous and death ensued on the morning of the 23rd.

CASE 3.—Very severe alkali deficit; uræmia and death after plasma bicarbonate had been maintained at a level little below normal for some weeks. Female, aged 25. Chronic interstitial nephritis. Breathless and giddy during last three or four years. Swelling under eyes since August, 1922, vomiting since September. Urine: Albumin, 1/10 volume, small amount of pus, daily output about 1200 c.cm. Very severe anæmia. Nov. 16th, 1922, drowsy, no hyperpnœa nor dyspnœa. Plasma bicarbonate, 13; pH, 7·2; blood-urea, 343 mg. per 100 c.cm. At midnight she was given 350 c.cm. 2 per cent. sodium bicarbonate intravenously, followed by a drachm of sodium bicarbonate by the mouth every three hours; on the 17th and 18th 1 dr. given every two hours with 3 gr. potassium bicarbonate, and 10 gr. calcium lactate. These salts were given every four hours on the 19th and discontinued on the 20th. On second two days of administration the output of urine was about 2 litres less than the intake of fluid. On the 20th plasma bicarbonate, 74; pH, 7·55; blood-urea, 400 mg. per 100 c.cm. On the 22nd muscular twitching, headache, and vomiting. On the 23rd plasma bicarbonate, 51; pH, 7·45; blood-urea, 505 mg. per 100 c.cm. On the 30th plasma bicarbonate, 41; pH, 7·35; blood-urea, 600 mg. per 100 c.cm. On Dec. 4th bicarbonate mixture given again with calcium lactate every four hours until death. On the 7th plasma bicarbonate, 48; pH, 7·35; blood-urea, 480 mg. per 100 c.cm. Patient died on the 8th after one fit.

Post-mortem Examination.—Very great destruction of kidney substance by chronic interstitial and little acute parenchymatous nephritis. Very great œdema of lungs, general œdema, ascites (1 pint), bilateral pleural effusion (½ pint each side).

CASE 4.—Severe alkali deficit with little disturbance. Female, aged 31, congenital cystic kidneys. History of polyuria and frequency since infancy. No cardiovascular hypertrophy; blood pressure, systolic, 135 to 145 mm.; diastolic, 85 to 90 mm. Able to do a moderate amount of work. Urine: Low specific gravity, containing a small amount of albumin and pus. From July, 1921, to March, 1922, phenolsulphonephthalein excretion in two hours from traces to 13 per cent.; urea-concentration test, 0·8 to 1·35 per cent.; blood-urea, 90 to 114 mg. per 100 c.cm.; plasma bicarbonate, 52 to 55. On Oct. 26th, 1922, still feeling well and able to work; no noticeable hyperpnœa. Plasma bicarbonate, 33; pH, 7·2; blood-urea, 141 mg. per 100 c.cm.

CASE 5.—Uræmia without alkali deficit. Male, aged 51. History of six months' illness with failing sight, weakness, and shortness of breath; later vomiting. On July 30th, 1921, two fits in the night; on the 31st unconscious with muscular twitching. Systolic blood pressure, 140 mm.; no cardiovascular hypertrophy. Urine only 46 oz. in three days; specific gravity, 1009; trace of albumin, deposit of pus. On the 31st plasma bicarbonate, 69; blood-urea, 152 mg. per 100 c.cm. Patient died on August 2nd.

I owe my thanks to the physicians of the London Hospital for the facilities they have afforded me in the study of their cases.

Reviews and Notices of Books.

HYGIENE AND PUBLIC HEALTH.

Seventh edit. By LOUIS C. PARKES, M.D., and Prof. H. R. KENWOOD. Lewis's Practical Series. London: H. K. Lewis and Co., Ltd. 1923. Pp. 783. 20*s.*

THE new edition of this well-known volume will deservedly hold its own in popularity as a text-book for public health students. The authors have endeavoured to embody recent advances in public health and sanitary science without increasing the size of the book—no easy task, when we consider how the scope of public health work has been widened by the inclusion of schemes for dealing with tuberculosis, maternity and child welfare, medical inspection of schools, venereal diseases, &c., and also how views and methods have changed with regard to water purification, sewage disposal, nutrition, and ventilation. The greater interest awakened in physical development, light treatment, smoke prevention, industrial hygiene, and tropical diseases also demands some satisfaction from a text-book. The authors have wisely decided to omit the chapter on sanitary law, references being, of course, made throughout the text to the laws and regulations on the subjects treated. Examining bodies are rather too fond of setting questions of a legal nature to candidates for sanitary certificates and diplomas. It is too often forgotten that town clerks and legal luminaries do not trust to their memory of sections of Acts of Parliament when taking proceedings.

When the time comes for the next edition, we think the authors will be well advised to lighten the ship still further by omitting or shortening the references to more or less obsolete appliances and matters of purely historic interest. For example, in these days, when the cult of the open window is being practised or preached for the ordinary dwelling-house, and in view of the recognised uncertainty as to whether in the absence of mechanical power the air in a so-called ventilation duct will move according to plan, there is little necessity to devote space to such things as Tobin's tubes, Ellison's conical bricks, and Montgolfier's formula. On the other hand, more space might usefully be devoted to smoke prevention. Similarly under the heading Biological Purification of Sewage, while there is an interesting history of methods adopted since 1891, the authors have not found space for any account of the Sheffield system which formed the subject of a leading article in our issue of May 27th, 1922. The "activated sludge" system is shortly described by the authors, but Mr. John Haworth, of Sheffield, found that by a simple process of churning with paddles he could get satisfactory aeration without using compressed air machinery. This process has passed the experimental stage and will be gradually applied to a dry weather flow of 15 million gallons in Sheffield. It is also in use in Paris, Glasgow, East Ham, and Rotherham, and schemes are in course of construction in other towns. There are, of course, many things in this many-sided book which invite criticism, according to the views of the critic. We do not think Sir Henry Gauvain would endorse the views of the authors (p. 289) on the clothing of children, and we are not sure that, apart from footgear, women do not dress as hygienically as men nowadays. A text-book on public health cannot deal exhaustively with all the diseases which come under review, but surely the risk of the oncome of rickets (pp. 313 and 314) should be placed earlier, to be in accord with modern views.

A chapter of 200 pages is devoted to communicable diseases and a good account is given of each with the methods suitable for prevention. We missed, however, that modern plague of Egypt—bilharziasis. We note one or two errors in the indexing—e.g., vitamin 399 for 309, bilharzia 307 for 337, on which pages its life-history appears with that of the other human parasitic worms. Sir William Hamer's theory of the causation of enteric fever in London by fish is treated somewhat vaguely (p. 481). Chapters X., XI., and XII. deal effectively with maternity and child welfare, school hygiene, and industrial hygiene respectively.

We can heartily recommend the new edition of this book as an admirable introduction to the study and practice of public health.

COLLOIDS.

Théorie colloïdale de la biologie et de la pathologie. By AUGUST LUMIERE, Correspondant national de l'Académie de Médecine, Paris. Éditeur : Etienne Chiron. 1922. Pp. 202. Fr.16.

THERE are many volumes on the subject of colloids in circulation at the present time. The majority are much alike, taking as they do the perplexed reader through various colloidal properties such as Brownian movement, adsorption, electrical potential, and the like. In addition to all this, he is harassed with pages of complex mathematical calculations, with the result that usually his state of knowledge when he finishes the book is the same as when he started. Fortunately there have been some exceptions to this series of books, among which the volume at present under consideration has a certain amount of claim to be placed. It is not difficult to follow and is attractive in many ways, but its scientific value is unfortunately doubtful. The book is divided into two sections, the first dealing with a summary of colloidal properties in general and the application of colloidal principles to physiology, and the second with the part played by colloids in pathology. The first 20 pages are devoted to a description of colloids from a purely scientific standpoint. This section is very sketchy, only the barest outlines being given. Using this as a foundation, the author employs the remainder of the book to build a superstructure of speculation. A colloidal interpretation of the origin of life, evolution, and death is given. In the second part colloids are shown to play an important part in anaphylaxis, immunity, and cancer.

Though the book is devoted almost entirely to speculation, the arguments are presented with remarkable clearness and make good reading.

PRACTICAL BACTERIOLOGY.

Blood Work and Animal Parasitology. Seventh edition. By E. R. STITT, A.B., Ph.G., Sc.D., LL.D., Rear-Admiral, Medical Corps, and Surgeon-General, U.S. Navy. London: H. K. Lewis and Co., Ltd. 1923. Pp. 766. 21*s*.

IF called upon to go to some remote spot, being permitted the privilege of taking with them only one work of reference, the odds are good that of the great mass of practical laboratory manuals nine out of ten clinical pathologists would choose "Stitt." The present is the seventh edition of this invaluable work; it has been enlarged and brought thoroughly up to date, and several new sections and many new illustrations have been added. The book, although now comprising 766 pages, remains of compact form and of a size and shape which will enable it to slip readily into any ordinary coat pocket; this portability remains one of the most engaging features of this work; every available inch of paper is taken up, even to the insides of the covers, in pleasing contrast to the wide margins and liberal spacing which render the modern American manual a most unwieldy means for the dissemination of knowledge.

The descriptions of technique in all sections are concise but none the less quite full enough for guidance, and include in all departments not only old and tried methods but also most of the recent ones of any value. For example, in the section on media-making the useful method described not long ago by McIntosh and Smart for the preparation of routine media finds place. The failure to include a description of the Dreyer Sigma reaction in the section on flocculation tests for syphilis is an omission which should be rectified in the next edition. In the section on blood grouping the classification of Janssky as opposed to that of Moss has been adopted; this change is made in conformance with the decision of authoritative scientific bodies in the States; but though the author has taken trouble to make the matter clear, it holds the seeds of confusion for workers in this country. Note is taken of the work of Guthrie and Huck, published only last spring, on the possible existence of a further "agglutinogen" C; this work is so recent and untested that it was perhaps hardly wise to include it. In the section on the cells of the blood, that test-point for hæmatologists, the differentiation of large "hyaline" or "mononuclear" cells from large lymphocytes is competently dealt with; the work of McJunkin on phagocytosis by large mononuclears and their possible or probable endothelial origin might have been mentioned. Very valuable are the sections on helminthology and medical entomology, and this remains almost the only work of its sort in which poisonous reptiles and fish are noticed. The only real criticism that can be made of the book is the absence, no doubt deliberate, of references.

Practical Bacteriology for Chemical Students. By DAVID ELLIS, Ph.D., D.Sc., F.R.S.E., Head of the Department of Bacteriology and Botany in the Royal Technical College, Glasgow. London: Longmans, Green and Co. 1923. Pp. 136. 4*s*. 6*d*.

THIS little book contains a detailed account of the elements of bacteriological technique, arranged as a series of practical exercises. It is the endeavour of the writer to give the chemical student (and we gather his attention is directed more particularly towards the industrial chemist) a sufficient competence of bacteriological knowledge to enable him to investigate processes involving microbial growth when he finds it necessary to do so. Rather inevitably we tend to judge the book by the standard of medical bacteriology, and in doing so we cannot feel that it is quite adequate, or that the author's attempt will be successful. Over six pages are devoted to the staining of spores and cilia, processes which are seldom called for and of little practical use. Gram's stain is described with the omission of the counterstain. The student is told to make up sterile solutions of sugars, and to keep these in drop bottles for adding to his broth when the occasion arises! These we consider evil practices. There is also a frequent repetition of calculations of a most simple nature, such as the finding of the mean of eight whole numbers which occupies a half of page 82, and the titration of the acidity of fluid, on page 60; these are quite unnecessary and already known to any form of chemical student. Prof. Ellis's diction is at times a little unnerving. He constantly speaks of "diagnosing" bacteria, when he means identifying them, and he directs us, when we are about to stain our slide, to "clutch it with a pair of pincers." We note that Figs. 36 and 37 are absent, although reference to them appears in the letterpress. Probably the book will be useful in the special field for which it is designed; it is not suitable for medical students.

CHIRURGIE VASCULAIRE CONSERVATRICE.

Par P. MOURE, Chirurgien des Hôpitaux de Paris. Paris: Masson et Cie. 1923. Pp. 179. Fr.12.

THIS volume provides in a compact form a comprehensive account of the surgery of the blood-vessels. The first part of the book deals with the more general questions of operative technique, difficulties, complications, and results. The second part gives an account of the surgery of recent injuries to blood-vessels, of aneurysms, of embolism and thrombosis of arteries, and of vascular anastomoses and grafts. It is useful to possess in so accessible a form clear accounts of operations which are but seldom carried out by most surgeons. The text is aided by a great many reproductions of semi-diagrammatic drawings. These drawings are, indeed, so clear that many of the operations appear to be much simpler than they actually are in practice; but apart from this the book may be taken as a reliable guide to the subject with which it deals. The text contains a large number of references to other authorities.

POST MORTEM; ESSAYS HISTORICAL AND MEDICAL.

By C. MACLAURIN, M.B., C.M., F.R.C.S.E., LL.D., Lecturer in Clinical Surgery, University of Sydney. London: Jonathan Cape. 1923. Pp. 255. 7*s.* 6*d.*

IT was with great relief that we opened this book to find that it was not a farrago of eschatology such as not so long ago used to appear in a weekly journal, for from the simple title we had feared that such might be the case. Instead, we found a series of more or less historical essays dealing mainly with the question as to how their conditions of health affected for good or ill various people notable in the history of the world. Somehow, to know that the Empress Theodora suffered from cancer or to consider that Jeanne D'Arc was an instance of infantilism and sex repression makes them more real to some people than if they are looked at solely from the point of history. Dr. MacLaurin writes in a breezy, but attention-compelling fashion. Here and there he falls into strange errors, as, for instance, on p. 69, where he makes Nestorius the author of the Monophysite heresy, when it was actually Eutyches, who fell into the heresy owing to his violent opposition to Nestorius. In his essay on Theodora he recalls the well-known and oft-repeated fact that violent sexuality is in some way related to powerful religious instincts, and in another passage that her career as Empress is "the most extraordinary instance on record of living a thing down." There was a comparable instance in our own times in the case of Laura Bell, whose marriage in 1852 to Mr. Thistlethwayte, after a notorious career, excited so much interest in society in the fifties and after. She took to holding revivalist services and enjoyed the friendship of many eminent people, including Gladstone, until her death in 1894. For details as to her religious services the inquirer should consult Lady St. Helier's Memories of Fifty Years. With regard to Gibbon Dr. MacLaurin asks on p. 187 whether the cause of his death was not acute septic peritonitis from the bursting of the septic hydrocele and hernia through the inguinal ring. It is, of course, possible that this happened, but there is no note of acute abdominal peritonitis in the official account of the post mortem. The contents of the sac were inflamed: "In omento et in intestino colo haud dubia recentis inflammationis signa vidimus." But the surgeon continues that when the abdomen was opened the stomach was found much displaced downwards, the liver was covered with small tubercles, and the gall-bladder distended. "In caeteris visceribus . . . . nulla morbi vestigia extiterunt." Other of Dr. MacLaurin's papers deal with Anne Boleyn, Charles V., Don John of Austria, and Marat. Altogether lovers of literature will be grateful to Dr. MacLaurin, and we hope to be able to welcome another work from his pen before long, only we advise him to take to heart the advice of Dr. Routh and "verify his references"; Cicero (p. 254) may have said "Video meliora proboque, deteriora sequor," but the remark is generally attributed to Ovid; Metamorph. VII., 20–21.

TRAITÉ D'OPHTALMOLOGIE.

By Dr. A. POULARD. In two volumes, with 710 illustrations and 3 coloured plates. Paris: Masson et Cie. 1923. Pp. 1457. Fr.120.

THIS work has the merit of being original in the sense that it does not slavishly follow the pattern of previous text-books. Instead of the usual preliminary chapters on the anatomy and physiology of the eye, an adequate knowledge of these things is taken for granted, and the book begins with a chapter on surgical technique with directions for sterilising, &c., and for administering local anæsthesia. After a second short chapter on methods of diagnosis, we are taken through the ordinary routine of ocular diseases in a way not very different from that of other text-books, the descriptions being greatly assisted by excellent illustrations. These are especially welcome in the sections dealing with operations. Dealing with wounds of the eyeball, the author deprecates the excessive dread of sympathetic ophthalmia, a dread which in his view is responsible for many unnecessary mutilations. He is opposed to the total enucleation of a wounded eye except in very special circumstances, and would in most cases substitute a partial evacuation with retention of the outer envelope or even of the whole posterior portion of the globe. So long as the ciliary body is removed there can, he says, be no danger. The probability is that in this he is right. Yet in view of the tragic consequences which have sometimes followed a too conservative procedure, most surgeons will still choose to be on the safe side, even at the sacrifice of some cosmetic advantage. The description of the major operations proceeds along accustomed lines, but operations on the lids are described and illustrated in greater detail than is usual. We must demur to the advocacy of probing with large probes for lacrymal obstruction. This treatment was formerly common in this country but has been very generally given up on account of the frequency with which false passages were made and the formation of secondary scar tissue caused. According to Poulard, excision of the sac is an operation only rarely required in cases where probing has proved ineffectual. We look in vain for a recognition of the danger of infection to the cornea in operation cases or of the fact that a common cause of hypopyon ulcer is regurgitation from a chronically inflamed sac. There are certain other omissions. The author justly criticises the use of the phrase "rheumatic iritis" for cases of iritis where the cause cannot be determined, but he fails to point out the different septic conditions which have been shown to have a causal relation to many of these cases. Again, in treating of ocular paralysis he justly remarks that cases attributed to cold are generally those in which the real cause is unknown, but he does not afford much help in arriving at a more exact diagnosis. Multiple sclerosis is only just mentioned as a possible cause.

The work is well written, well printed, and well illustrated, but it is not a text-book likely to supplant those already popular with English-speaking students.

MONTAIGNE AND MEDICINE.

By JAMES SPOTTISWOODE TAYLOR, M.D. Lond., Commander, Medical Corps, U.S. Navy. Oxford University Press: Humphrey Milford. Pp. 244. 14*s.*

THIS book is a reprint of a series of papers which we have noticed from time to time, as they appeared in "Annals of Medical History," Vol. III., Nos. 2, 3, and 4, published in November, 1922. In book form many additional illustrations have been supplied. Montaigne is one of those discursive and personal writers to whose works, as to those of Sir Thomas Browne, Feltham of the "Resolves," Burton, and Montagu, who wrote "Manchester al Mondo," we return again and again, and Commander Taylor here puts before his readers in a handy form Montaigne's comments on contemporary medicine and physicians, his thoughts on matters of life and death, an account of his ailments (he suffered much from urinary calculi), and his travels in search of health, all these excerpts being interspersed with shrewd comments of his own. We think that Commander Taylor has rather strained the likeness between Montaigne and physicians; when we read his comparisons we cannot help remembering that "there is a river in Macedon, and there is also moreover a river at Monmouth . . . . and there is salmons in both." We draw attention to this with the less reserve in that Commander Taylor himself seems to doubt what he calls "perhaps superficial parallelisms and analogies." However, he has produced a most interesting book for which we are grateful. We may note modern parallel to Montaigne's account of the Flagellants whom he saw in Rome. On p. 174 Commander Taylor quotes from his account of how the penitents scourged themselves with ropes until their backs were raw and bloody, and he was struck with their apparent indifference to pain. The same scene may be witnessed in Persia to-day at the Moharram festival where the devotees scourge themselves with heavy chains until the back and shoulders are a mass of bloody bruises, while others slice their heads with swords until the blood streams down over the long white shirts which they wear.

Encyclopédie Française d'Urologie.

Edited by Dr. A. Pousson, Professeur à la Faculté de Médecine de Bordeaux, and Dr. E. Desnos, Secrétaire Général de la Société International d'Urologie. Paris: Octave Doin. 1922. Vols. V., pp. 1110, and VI., pp. 1086. Each vol. Fr.60. Vols. I.–VI. complete Fr.300.

These two compendious volumes form parts of an important work on urology by various French authors. The scheme of the work is encyclopædic. The literature of each subject is collated, and a very extensive classified bibliography is added at the end of each chapter. The views and methods of many authorities are concisely given without interfering unduly with the thread of the narrative. Vol. V. is entirely devoted to diseases of the urethra. Among many important articles may be noted examination of the urethra and urethroscopy by Nogués and Papin, some excellent coloured illustrations being included in this article. Stricture of the urethra and its complications is described in 215 pages by Escat, and further space is devoted to the technique of operations on the urethra by Nogués, Heitz Boyer, and Genouville. Vol. VI. deals entirely with diseases of the prostate and urinary symptoms in general. There are chapters on the examination and injuries of the prostate (André), inflammation, calculi and cysts (Oraison), hypertrophy (Marion), malignant tumours (Pauchet), tuberculosis (Erzbishoff). The extent and thoroughness of the work may be gauged by the fact that the article on hypertrophy of the prostate by Marion extends to 187 closely printed pages, with an additional 16 pages for the bibliography. In this section the author gives an account of the present knowledge of simple enlargement of the prostate and its treatment. In another section he describes the operative technique he personally adopts. The section on urinary symptoms includes such mechanical conditions as retention and incontinence of urine (Delbet), and abnormal conditions of the urinary secretion and composition, such as anuria, phosphaturia, oxaluria, glycosuria, &c.

It is impossible to discuss the various subjects in detail, but it may be said that the thoroughness with which the literature is collated and the high standard of the discussion are maintained throughout. These volumes form, with the others which have already appeared, one of the most extensive and authoritative publications on urology at the present time. They should be included in the reference library of every urinary surgeon and may be recommended to the notice of physicians studying the medical aspects of urinary disease.

Poisonous Plants of All Countries.

Second edition. By A. Bernhard-Smith, L.M.M.S.A. London: Baillière, Tindall and Cox. 1923. Pp. 112. 6*s*.

This book consists of a list of the known poisonous plants. Of each plant, the nationality, popular synonyms, the natural order, the chief characteristics and season of flowering, and the toxic principles are given. Then follow a few lines from one of the poets—some apt, some of doubtful suitability. A small illustration is given of nearly all the 150 plants named.

The value of the book is as one of reference, an intermediary between a work on botany and one on toxicology. It would be more compact and would bear a more business-like air if the quotations were omitted. Some lines on the relative toxicity of the plants would please its readers more than lines of poetry. The appendix with lists of "plants reputed poisonous" is especially tantalising, as one gets no clue as to whether the reputation is true or false. The illustrations, uncoloured and small, are quite good for their size, but are not sufficiently detailed to help much in the recognition of the plants. Some of the active principles given do not correspond in title to those accepted by pharmacologists—scillipiain is given for squill, rheonilic acid for rhubarb; laburnum and its poison are given as cystisus, and cystisine instead of cytisus and cytisine. The plants are divided into classes according to the action of their poisonous constituent—namely, those acting on brain, spinal cord, and heart, irritant poisons, and specific irritants. These last include micro-fungi and bacteria. As, however, symptoms are not given, this division does not carry much value. The book may be useful in putting the reader on the track of any poisonous plant he wishes to study, but he will not find much of value about the plants in its pages.

Differential Diagnosis of Internal Diseases.

By M. Howard Fussell, M.D., Professor of Applied Therapeutics at the University of Pennsylvania; Physician to the Hospital of the University of Pennsylvania. London and New York: D. Appleton and Co. 1923. Pp. 880. 35*s*.

This is a reprint of a popular volume by the late Prof. Fussell. It follows the classification of diseases used in Osler's Text-book, and deals at length with the differential diagnosis in each case. Certain omissions, such as the similarity of gastric syphilis and carcinoma of the stomach, and the importance of cardiac and renal diseases in the differential diagnosis of ascites, call for correction, but the volume as a whole is a well-arranged and useful one. As a work of reference for the general practitioner it should be welcome.

Accidents du Travail.

Guide pour l'évaluation des incapacités. Second edition. Par Léon Imbert, C. Oddo, P. Chavernac. Paris: Masson et Cie. 1923. Pp. 936. Fr.40.

This book is primarily written for those who have medico-legal responsibilities connected with the French law of 1898 et seq., to facilitate the consideration of problems arising in connexion with industrial accidents and occupational diseases. The authors have written lucidly in their several sections; for medical men information is given as to the bases of legislation and jurisprudence in relation to the results and sequelæ of accidents. For the legal profession essential medical information is provided and expressed in language free, so far as is possible, of technical medical terms.

This second edition is entirely re-written and, in fact, constitutes almost a new work. New and unlooked for problems have arisen, many of them consequent on the recent war. The ground covered is extensive. Industrial sickness and its development; traumatism in relation to the incidence (post-traumatic) of tuberculosis, cancer, and general disease; the traumatic chronic arthopathies; the chronic œdemas, thrombophlebitis of the limbs; regional injuries, including the eye, ear, and central nervous system; traumatism in relation to the genito-urinary system (male and female); psychoneuroses in relation to industrial accidents are among the subjects dealt with. The views of the authors may not be accepted in every detail, but they have ventilated in a provocative and able manner problems that are of considerable and sometimes pressing importance.

An appreciable number of ex-Service men in our own country have developed pulmonary tuberculosis after their disabilities of gunshot wounds or traumatic injuries of the chest or chest wall. The lapse of time in some cases between the original injury and the overt symptoms or signs of tuberculosis may cover several years, and it is then difficult to link up the new infection as having relation to the original disability. The authors state that it is recognised that traumatism may, in certain cases, be the means of inoculating or localising tubercle; of aggravating or revealing existing or latent tuberculosis. In rare cases an accident may cause a generalisation of pre-existing tubercle. War experience has, in their opinion, to a large extent, confirmed the fact that severe and extensive injuries are not found to be followed by tuberculosis nearly so frequently as when the injuries have provoked less severe reactions. Sergent, Challamel, Léon Bernard are quoted, and the consensus of opinion suggests that penetrating wounds of the chest, producing comparatively little immediate effects, may several years later be the starting-point of pulmonary tubercle. As to traumatic nephritis, traumatism is stated to produce in a previously healthy kidney lesions which in their chronic character and by their extension to the other kidney are clinically akin to Bright's disease and may be confounded with it. The difficulties and problems raised in accepting this condition as a new disease entity are appreciated and discussed. The volume, though somewhat bulky, is worthy of careful perusal.

Hodgkin's Disease.

By R. A. Bennett, M.D. Lond., M.R.C.P. Bristol: John Wright and Sons. 1923. Pp. 56. 2*s*.

In this pamphlet the author gives an excellent straightforward account of Hodgkin's disease based on his own experience of 15 cases and covering much the same ground as the articles on the subject in the larger systems of medicine. The author has no particular fresh view to bring forward, but in an open-minded discussion of the causation of the disease he inclines to the view that it is due to tubercle bacilli which have been altered by the lipolytic ferment of lymphocytes operating in individuals of a peculiar disposition. As an empirical trick for controlling the bouts of fever, he commends the inunction of creosote (½ drachm) in the axilla or groin.

Books for Nurses.

Pocket Cyclopædia of Nursing. First edition. Edited by R. J. E. Scott, M.A., B.C.L., M.D. New York: The Macmillan Company. 1923. Pp. 746. 14*s*.

This pocket cyclopædia of nursing comes at a time when the trained nurse and the nurse in training, anticipating examinations by the State, feel a special need for some handy book of reference in addition to the general text-book. The contributors to this excellent cyclopædia include 13 American registered nurses, so that the nurses' needs have been supplied by those who appreciate from practical experience their point of view. All subjects are alphabetically arranged, and the use of a large number of cross references takes the place of a general index. This cyclopædia should be popular, supplying as it does just the information which is often sought vainly in a dictionary. The information given is by no means superficial, but has been well chosen, and in cases of disease not only is there a lucid explanation given, but a description of the nursing care and treatment follows. Six excellent pages are devoted to diabetes mellitus, and valuable references made to the psychoneuroses. A number of illustrations are included.

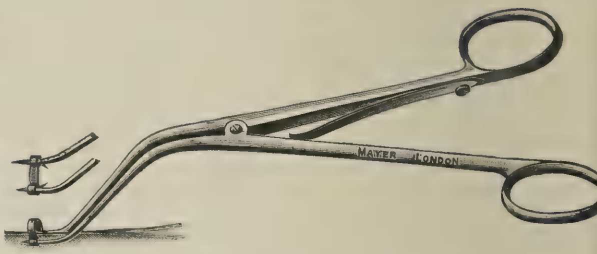
Principles of Home Nursing. By E. L. Mohs, R.N., A.B. London and Philadelphia: W. B. Saunders Company. 1923. Pp. 307. 10*s*.

Miss Mohs has written a book full of useful information, but a book more suitable for the trained nurse or the nurse in training than for the lay mind interested in home nursing. There is an exhaustive chapter on bacteriology with detailed directions as to the use of the microscope for the observation of bacteria and the technique employed in making throat cultures. The "home nurse" in this country would neither be expected to have an extensive knowledge of bacteriology nor would she be called upon to take throat cultures, reduce a dislocated jaw, or to understand the sphygmomanometer. The title of this book is misleading, unless it was intended to imply that it contained information necessary for the trained nurse in the home.

New Inventions.

SUTURE REMOVING FORCEPS.

The usual methods of removing Michel Clips have great disadvantages. In one the under blade of a special pair of forceps has to be forced up against the actual wound, and in the other, where two hooks are used, the method is clumsy and the hooks are not easy to manipulate. I have therefore had made a pair of forceps angled twice on the flat with two points instead of blades, one point being 1/16 in. longer than the other. These points are separated by closing the handles and are normally held together by a strong spring. The method of use is to insert the longer point into an eye of the clip, and while this point is steadied the shorter one can easily be fitted into the other eye. The handles are then closed and the clip is stretched out flat, being then easily removed. There is no discomfort to the patient and the forceps are very easy to use.

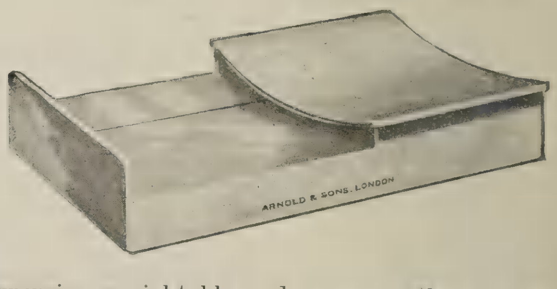


Messrs. Mayer and Phelps, Chiron House, New Cavendish-street, are the manufacturers of the instrument.

Shrewsbury. Frank H. Edwards, M.B., M.R.C.S.

COMBINED IRRIGATION TRAY AND PELVIC REST.

The combined irrigation tray and pelvic rest, here illustrated, is a convenience to the surgeon as it enables him to use a cystoscope, or any other irrigating bladder or urethral instrument on an ordinary consulting room couch, or theatre operating table. It does away with the necessity for an expensive special table, and overcomes the objections (instability—splashing of couch and towels) which arise from the use of a makeshift, such as a sandbag and separate tray or kidney basin. With the back of the consulting-room couch raised, the tray can be used for urethral irrigation with the patient in a sitting or reclining posture, with the couch flat it gives the necessary pelvic elevation for a cystoscopic examination.



The apparatus, which is strongly made to carry a stout patient, and finished in white enamel, has been made for me by Messrs. Arnold and Sons, of 50/52, Wigmore-street, W.

Sheffield. Thos. B. Mouat, F.R.C.S. Eng.

THE LANCET.

LONDON: SATURDAY, SEPTEMBER 22, 1923.

THE STATE OF PUBLIC HEALTH.

THE Annual Report[1] of the Chief Medical Officer of the Ministry of Health for 1922 is a voluminous but closely-written document and should be in the hands of every public man and woman, for the right conduct of national health is alike a matter of the gravest and most general concern. The Report commences by giving the statistics illustrating the state of public health in England for the year 1922, and the figures show that, while great gains have been made recently in the health of the nation, and while the death-rate is declining and the expectation of life growing longer, there remain certain places in which the mortality has grown more serious and the position demands inquiry. The number of births registered in 1922 show a decline, while the death-rate is slightly higher than in the previous two years, but nevertheless the expectation of life at birth in this country, as indicated by the figures, is 11 years longer for males and 13 years longer for females than it was 60 years ago. That is the kind of generality which means a great deal when its import is realised. The infantile mortality rate is the lowest yet recorded in the country, although admittedly there is much unnecessary loss of life both for mother and infant in the first month of infancy, while the figures in respect of epidemic infectious diseases give no common message. Measles, pneumonia, and scarlet fever present high notification figures, but diphtheria, enteric, cerebro-spinal fever, encephalitis, and tuberculosis indicate a decline of incidence. Of the two great non-notifiable diseases, venereal disease and cancer, the broad deduction from the facts and figures seems to be that venereal disease has declined and that cancer has substantially increased. The disturbing position with regard to cancer is made the subject of detailed treatment, and those who talk glibly about the supineness of science in the face of a mortal scourge would do well to read closely this section of the Report, if only to ascertain how much work is being done, for how long a period much of it has been carried on, and how valuable is the information which has already been obtained. The Cancer Committee of the Ministry is engaged in a number of inquiries, statistical, nutritional, and epidemiological, and has as one of its principal objects the coördination of investigation in this country and abroad. Happily several organisations have for many years been occupied with this subject, and the accomplishments of the Cancer Department of the Middlesex Hospital, the Imperial Cancer Research Fund, the Cancer Hospital in Fulham-road, and the Radium Institute will be taken into consideration, as well as the work done in various places under the auspices of the Medical Research Council. In May of the present year the British Empire Cancer Campaign was initiated to make a wider appeal for public financial support in the common struggle against cancer, and it would be unreasonable to suppose that nothing more will come of such varied and intensive activities, though in our ignorance of causal agencies no one can prophesy the rate of progress.

A long and interesting section is that dealing with the relation of food to health and disease, in which the questions of the inspection of meat, the sale of food and drugs, the grading of milk, and the general safeguards of our food-supply are gone into. The section is illustrated by a summary of inquiries into cases of food poisoning which occurred during the year, several of the examples given, like that of the outbreak of botulism in Loch Maree, having been fully reported in our own columns. An adequate supply of wholesome food is one of the most important factors in the production and maintenance of national health and efficiency and, as Sir GEORGE NEWMAN points out, this was abundantly proved during the European war, when it was found that the soldier could withstand without detriment to health all manner of hardships and exposures so long as he was regularly provided with sufficient and suitable food. We recommend for serious attention the advice given for the protection of the consumer against food poisoning, for it has not been considered sufficient to supply such general statements as that the premises should be clean, that materials should be of good quality and be properly stored, and that throughout distribution care should be exercised of the finest, and so on. The health and cleanliness of the worker is introduced as a factor of the first importance in the following words: "Whatever is permissible in other industries, the only satisfactory arrangement in respect of food is that it should be prepared by persons entirely free from any communicable or infectious disease, local or general. Such a condition demands (*a*) careful selection and adequate medical supervision of the workers; (*b*) strict cleanliness of person and clothing, which means facilities for washing and suitable clean overalls; and (*c*) the special supervision of healthy workers who have been in contact with cases of disease ('contacts') or carry infection without suffering from disease ('carriers').' It is now the duty of all local authorities to notify the Ministry promptly on the occurrence of food poisoning, and we may say here that that duty is shared by the consumer. Information should be given by the public to the medical officer of health when there is any suspicion that food poisoning has occurred, for only in this way can, on the one hand, abuses be detected promptly, and, on the other, foolish alarms be avoided. Before now the inadvertent creation of food scares has produced an attitude in regard to food poisoning whose influence on the health of the nation as a whole may have been more serious than that of the particular outbreak of poisoning itself.

Throughout the Report there runs the general message which is repeated in so many words in Sir GEORGE NEWMAN'S concluding observations—wise government depends on the assent of the governed. Members of the public are under obligations to cultivate their own health and capacity and so to conduct themselves as not to conduce to the hurt or risk of their neighbours. Preventive medicine is what we have to look for in the future, and its progress must depend in high degree upon the enlightenment of the people.

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[1] On the State of the Public Health. Annual Report of the Chief Medical Officer of the Ministry of Health for the Year 1922. London: H.M. Stationery Office. 1923.

CANCER AND DIET.

MOST medical men will have been startled to find in their morning papers last Saturday headlines announcing in more or less flamboyant terms a great discovery in the treatment of cancer by diet, communicated to the meeting of the British Association in Liverpool by Dr. S. MONCKTON COPEMAN. Sensational statements on medical subjects which appear in the daily press do not often demand comment from us, but in this instance weight is given to the statements by Dr. COPEMAN'S standing as a public man and one to whom preventive medicine is substantially in debt. On the basis of the newspaper reports Dr. COPEMAN is apparently of opinion that vitamin A, while of great importance to the young and growing organism, is of comparatively little importance to the adult. Now the effect of rationing during the war years, especially in the Central European States, was essentially a rationing in those foods, such as butter and milk, which in a normal dietary provide the fat-soluble vitamin A, and the disastrous effects of this experiment on a large scale do not bear out Dr. COPEMAN'S contention, which does not seem to be based on any original investigation of his own. In papers[1] [2] published two years ago in our columns the workers from the Lister Institute attributed the hunger-osteomalacia which occurred in Vienna in 1920 to a fat-soluble A deficiency. They also showed that the disease affected chiefly middle-aged and old people of both sexes. Moreover, Dr. COPEMAN seems to have overlooked the literature on the subject. In 1919 Prof. J. C. DRUMMOND[3] undertook an experimental investigation designed especially to test this very point, and he concluded that the adult animal organism requires a regular supply of vitamin A, although the daily requirement is of a smaller order than that necessary to ensure growth in a young animal. Prof. DRUMMOND states that "there is every reason that great care should be taken to ensure that dietaries of adults contain an adequate supply of foodstuffs in which fat-soluble A is present.... In the absence of this factor the resistance to diseases of bacterial origin is seriously impaired." The statement by Dr. COPEMAN that an excess of vitamin A in the diet might eventually become injurious is contrary to all available experimental evidence.

It is difficult to understand the rationale of Dr. COPEMAN'S diet. It is not a vegetarian diet, for he allows ham and bacon. Were his premises correct, then the restriction of vitamin A, which is a factor necessary for the growth of a young animal, should have a retarding effect on the growth of cancer. But the diet actually recommended by Dr. COPEMAN is not a diet free from this factor. He excludes animal fats containing vitamin A such as butter, eggs, and cream, but he adds lettuce and watercress which, as he himself states, contain fat-soluble A. On the basis of his own arguments there is no reason why such a diet should have any effect on the growth of cancer, unless he presumes, as he appears to do, that an amount of vitamin A insufficient to maintain the growth of cancer cells is adequate to maintain the well-being of the patient. But here again experimental evidence has been adduced to show that the growth of cancer cells proceeds quite independently of the presence or absence of vitamin A. Prof. DRUMMOND[4] demonstrated in 1917 that the growth of cancer cells in rats is not inhibited by the complete absence of the fat-soluble vitamin A, and that, in fact, it is not possible to bring about an inhibition of tumour growth by employment of any dietetic restrictions without the nutrition of the host becoming seriously impaired. More recently work in the laboratories of the Imperial Cancer Research Fund has led to exactly the same conclusion.[5] In 1922 we published a paper by Dr. STANLEY WYARD[6] in which he reported on the results obtained in cancer patients by placing them on a diet deficient in vitamin A. This was done at the suggestion of Dr. COPEMAN himself, who was responsible for the composition of the diet. Dr. WYARD'S conclusion was that the results were entirely negative. The diet now adopted by Dr. COPEMAN differs from that which he recommended to Dr. WYARD in containing more vitamin A. It is difficult to gather what claims Dr. COPEMAN now makes for this new diet. It is said to alleviate pain. But the dismal history of cancer remedies shows that this claim is made for every remedy that has failed in other respects. He also claims an increased expectation of life. From the reports published in the press it is impossible to see how Dr. COPEMAN justifies this claim. How many cases has he had under observation? Has he selected his cases or has he chosen his cases indiscriminately? And how does he calculate the expectation of life of a patient afflicted with cancer and not undergoing his treatment?

Dr. COPEMAN may complain that we are criticising his statements on incomplete reports. But it is these reports which have been laid before a lay audience and circulated widely in the press, and their details have not been submitted to the judgment and criticism of his peers. Dr. COPEMAN is a member of the Departmental Cancer Committee, appointed by the Ministry of Health under the chairmanship of Sir GEORGE NEWMAN, which has recently issued an excellent memorandum on the whole cancer problem. The omission from this memorandum of any reference to the effect of diet on the treatment of cancer suggests that Dr. COPEMAN has been unable to convince his colleagues and has now appealed to a wider though less critical audience.

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THE KITCHENER MEMORIAL MEDICAL SCHOOL.

Lord KITCHENER on the occasion of his last visit to the Sudan expressed a strong wish that there should be a medical training school for Sudanese students at Khartoum, and no more suitable memorial for the great soldier could have been chosen than to found such an institution. The proposal appealed to the Sudanese Arabs as well as to KITCHENER'S own countrymen, and as a matter of fact of the £13,000 which had been subscribed by the end of last year, all but £2000 came from the natives of the Sudan, while in addition one Sudan merchant has handed over all his property to trustees in order that on his death the income, which will amount to some £1200 a year, may be devoted to the maintenance of the medical students. There is pressing need for this medical training school in order that young Sudanese doctors may work under Government supervision to bring assistance to the inhabitants of vast districts which are fever-ridden or subject to epidemic and endemic attacks of a dangerous and sometimes decimating character. In addition to malaria, tuberculosis, dysentery, enteric fever, small-pox, and syphilis, there remain to be treated sleeping sickness, kala-azar, bilharziasis, elephantiasis and leprosy, ankylostomiasis and ophthalmia, and the Government of the Sudan is quite unable to deal with the medical and sanitary needs of the immense areas unless a staff of medical men can be established, inured to the climate and familiar with the customs of the people.

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[1] Elsie Dalyell and Harriette Chick: THE LANCET, 1921, ii., 842.

[2] Margaret Hume and Edmund Nirenstein: Ibid., 849.

[3] J. C. Drummond: Biochem. Jour., 1919, xiii., 94.

[4] Drummond: Biochem. Jour., 1917, xi., 325.

[5] Nineteenth Annual Report of the Imperial Cancer Research Fund, 1922.

[6] S. Wyard: THE LANCET, 1922, i., 840.

The experience of Khartoum Civil Hospital in the case of a few selected youths has shown that the Sudanese Arabs can be trained to be useful medical assistants, and in April of last year, although sufficient funds had not been raised, it was decided to commence the medical school buildings. The immediate object is to give a four years' period of instruction to 12 selected young men each year. The proposed curriculum allots two years to pure and applied science and two years to medicine, surgery, midwifery, and hygiene, out-patient attendance being required for the last three years; a diploma will be conferred on successful candidates, practice being limited to the Sudan and based on certain specified conditions. This is the method by which it is designed to obtain a corps of conscientious assistants, accurately trained up to a definite standard, but as soon as the immediate need for doctors has been met in this way, and a suitable teaching staff has been built up, it is proposed to extend the length of the medical course and to bring the curriculum up to the standard demanded by European medical schools. The most promising of the medical assistants will be referred back to complete this fuller course, in addition to other selected youths from the Gordon Memorial College, Khartoum, who would have received preliminary scientific instruction. For the medical school will be an integral part of the Gordon Memorial College, and the trustees and executive committee of that College are being asked to act for the school.

The expenditure involved by the immediate scheme is modest, but substantial, and the money is urgently required that the project, while under weigh, may be completed without delay and its consequent embarrassments. All capital expenditure up to now has been met, and £20,000 remain towards the endowment fund. The close estimates of annual expenditure show that £3000 per annum will be required, to provide for which an endowment fund of £60,000 is needed, but this amount has already been reduced by substantial sums; £40,000 at any rate is still required at once. Owing to the Government being prepared to lend the services of its scientific and medical staff during the initial years of the enterprise, to carry out the teaching in addition to their other duties, the expenditure in this direction is extraordinarily small, while the school is fortunate in that the Wellcome Tropical Research Laboratories are installed in the Gordon College a short distance from the medical school, and the director of these Laboratories will assist in the scientific and medical teaching. If, as all believe, those who help themselves are the people who deserve to be helped, the claim of the Sudanese is a strong one. The natives showed the greatest loyalty throughout the war, they contributed over £34,000 to the Red Cross Fund, and, as has been said, the first £13,000 subscribed in the Sudan for the medical school buildings was for the most part given by the natives of the country. The need then is real and urgent; the work has been begun with confidence in the strength of the appeal; those most directly interested have done their utmost to forward the movement; and the sum asked for is small. In these circumstances we hope that those responsible for the Kitchener Memorial Medical School will have their anxiety with regard to money speedily removed.

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WE understand that the British Red Cross Society is in close touch with the Japanese Embassy in London, and is working in conjunction with a committee formed at the Japanese Embassy, with a view to providing assistance for Japan. So far the question of sending personnel to that country has not arisen. Present information goes to show that what is required is food and clothing, and it is not considered likely that doctors and nurses will be sent out unless a definite appeal to do so is received from the Japanese Red Cross.

Annotations.

"Ne quid nimis"

THE HOSPITAL ALMONER AND SOCIAL SERVICE.

WHEN Florence Nightingale went to the Crimea she found that it was impossible to apply medical treatment without at the same time attending to the more personal and economic wants of her patients. "The fact is," she wrote to Sidney Herbert, "I am now clothing the British Army." The social service work of the present-day hospitals is an outcome of precisely this same necessity, and although the almoners' departments of the voluntary hospitals have always modestly avoided the limelight, an ever-increasing need continues to develop this side of our voluntary hospital system. In this work St. Thomas's Hospital blazed the trail during the pioneer days when vicarious charity was blindly attempting to deal with an impossible problem. Starting in 1905 as a Social Service Office in connexion with the Casualty Department, the almoner's work has steadily increased until the St. Thomas's office deals with 16,000 inquiries in one year, and raises more than £5000 apart from invested income; and there would seem to be every prospect of social service work of all kinds increasing as time goes on. In these days the raison d'être is not far to seek. Few patients present themselves for treatment at hospital who have not got some economic problem the solution of which is intimately related to the cure of their illness. Physician, nurse, and almoner are interdependent. As a good example of this question the latest St. Thomas's report[1] states that during the last seven months of 1922, 295 children were recommended by the out-patient surgical staff for operation for enlarged tonsils and adenoids. Before operation the homes of these cases were all visited by the almoner, and it was found that 200 had homes where the children could receive simple post-operative treatment, whilst 95 had to be admitted to the wards on account of unsatisfactory home conditions. Amongst those refused were found children who, after operation, would have had to share a bed with two or even three other children, or would have had no proper bed at all. In the report of the almoner of the Royal London Ophthalmic Hospital, Moorfields,[2] the value of such inquiries is again emphasised, especially in cases of ophthalmia neonatorum, where every effort, economic and medical, must be made to prevent permanent blindness.

The following up of cases which have been discharged from hospital is yet another service falling to the lot of the social service departments. Both the St. Thomas's and the Moorfields reports show how necessary this task may be in the case of blind patients, for whom suitable employment, on leaving hospital, is often difficult to find. The Moorfields report points out that the giving of small sums of money will not solve the problem of the future for a man who is going blind; he must probably face a year or two of straitened circumstances whilst he is learning a suitable trade, and it is during this period that sympathetic backing from the hospital means everything to him. Some day, perhaps, we shall see established in London a special employment bureau which will concern itself entirely with the welfare of those discharged hospital patients who are only fit for certain occupations and can only work under favourable conditions. Such an invalid employment bureau is greatly needed, but it would require the utmost sympathetic coöperation on the part of employers, trade unions, doctors, and social service workers. Probably only those who work in the departments concerned realise the work that is done by the almoner's office in bridging the gap between the voluntary hospitals and the various State grants. Hospital departments dealing with school-children, pensioners, and tuberculous patients, venereal disease clinics with their hostels and after-care work, maternity and child-welfare centres all find in the almoner a connecting link. It is true, of course, that patients will from time to time abuse the voluntary hospital system by concealing their financial position, but the St. Thomas's report places it on record that on the whole "patients are amazingly honest in their dealings with the hospital, and are apt quite as often to omit some liability, such as the support of an aged parent, as to conceal some source of income." The almoner, in fact, touches life at many points and in all her dealings the aim is not to pauperise but to help patients to help themselves, not to demoralise but to assist these victims of adverse circumstances to develop their own personalities under the stress of difficulties and hard times.

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[1] Annual Report on the Work of the Social Service Department, Samaritan Fund and Northcote Trust. 1922.

[2] Report of the Samaritan Fund and the Work of the Almoner's Department. 1922.

SYMBIOSIS.

SOMEONE has said profoundly that dirt is matter in the wrong place, and the aphorism has been accepted as condensing in a phrase the valuable lesson that much that in some circumstance appears to be merely repellent may in other circumstances be highly beneficent. The discovery of the agencies by which symbiosis is carried on in animals and plants goes one step further in showing that two things may be associated together in conditions hardly distinguishable from parasitism, the partnership being necessary to insure their joint lives, while the word parasitism generally implies mischief to the host. The bacteroids in the nodules of leguminous plants fix the atmospheric nitrogen, and thereby render that nitrogen available for assimilation by the plants; that is a simple example of symbiosis where the micro-organisms carry on necessary work for a common life. Prof. Nuttall, the Quick Professor and Director of the Molteno Institute for Research in Parasitology at the University of Cambridge, made symbiosis the subject of his presidential address at the British Medical Association, and gave many interesting examples of the process in plants, animals, and insects. The subject has been much worked upon recently, and is of interest equally to the physiologist, the pathologist, and the parasitologist. It may easily be imagined that the investigation of the various problems is fraught with difficulties, and sometimes conclusions as to the interrelations of the various bodies cannot yet be arrived at, but Prof. Nuttall concludes that further discoveries are approaching, and that a wide field of fruitful research is open to those British workers who enter upon it

BLOOD PRESSURE IN THE NEW-BORN.

IN a recent communication to the Chicago Gynecological Society, Dr. Ralph A. Reis and Dr. Arthur J. Chaloupka[1] described their observations at the maternity of the Michael Reese Hospital, Chicago, on the blood pressure of 100 new-born infants following normal and pathological labour. The readings were all taken with a mercury manometer and an arm band 6 cm. wide. It was found that the average systolic blood pressure during the first day of life in 55 full-term infants following normal spontaneous labour was 43 mm. Hg, the minimum record being 32 and the maximum 58 mm. There was a gradual daily increase in the blood pressure until, on the tenth day, beyond which, owing to the mothers' discharge from hospital, the observations were not continued, the average reading was 78 mm. The greatest rise was during the first three days, the reading being 59 mm. on the fourth day. As a general rule, the blood pressure was higher in heavy infants. The sex of the infant, the presence or absence of jaundice or fever, the pulse-rate, and caput succedaneum appeared to have no effect upon the blood pressure. Low readings were met with in premature infants and twins proportionate to the birth weight and prematurity, while the greatest increase in blood pressure was shown after midplane forceps extraction and version extraction, and lesser increases after low forceps extraction, relatively dry labours, prolonged second stages, and in infants with large cephalic measurements. The increased blood pressure in all these cases appeared to be due directly to increased trauma to the fœtal head. With clinical improvement the blood-pressure readings gradually approached the normal.

CONGENITAL MIOSIS.

EXTREME contraction of the pupils, apart from the effects of iritis, is generally the result either of spinal disease or of drugs. An instance is recorded in the September number of the *British Journal of Ophthalmology*, by S. Holth of Christiania, where it was due to neither of these causes but was present as a family affection in two sisters and a brother, in each case the condition being permanent, having been noted in two of them as unchanged after an interval of more than 20 years. All three had pupils of about 0·5 mm. diameter, which, after the instillation of mydriatics, never dilated further than 2·5 mm. In one of the sisters the condition was associated with spasm of accommodation, but in the other two cases it was not. The interest of this observation lies in its affording a new instance of family inheritance. The parents were first cousins and the father, who was only seen once, was noted to have rather small pupils, 2·5 mm. in diameter. Two of the affected members died and their eyes were obtained for pathological examination. The anatomical explanation of the condition was pronounced to be the defective development of the dilator muscular fibres of the iris. As to this it might be objected that the dilator muscle of the iris is normally so slight in development that for many years its existence was doubted. On the other hand, the persistence of partial miosis after the use of mydriatics and the permanent nature of the condition negatives the idea that spasm of the contractor muscle can have been the cause, and an affection of the sympathetic was excluded by the instillation of cocaine which enlarged the palpebral fissure while having no effect on the pupil. The only symptom complained of was a certain degree of night blindness owing to the defect of normal dilatation of the pupil in the dark. Two of the three patients were myopic and in their case the daily use of atropine or hyoscine was found to be a sufficient treatment. In the case of a patient who is not a myope, a small optical iridectomy would appear to be indicated.

THE WASSERMANN REACTION IN LEPROSY.

Major R. B. Lloyd, Dr. E. Muir, and Mr. G. C. Mitra,[1] of the School of Tropical Medicine, Calcutta, examined the Wassermann reaction in a series of 286 unselected cases of undoubted leprosy, consisting of 228 adults and 58 children. The adult cases came from the leper asylums of Gobra and Allahabad, and from the out-patient department of the Calcutta School of Tropical Medicine, and the children from the Purulin Leper Asylum. Each blood was tested with three separate antigens—viz., (1) a cholesterinised alcoholic antigen, (2) Noguchi's antigen, and (3) Bordet's antigen, to which 0·4 per cent. of cholesterin was added. Among the adult patients a positive reaction was found in 41·7 per cent. of all cases, in 27 per cent. of the anæsthetic cases, in 47·4 per cent. of the mixed cases, and in 63 per cent. of the nodular cases. Among the children the figures were much higher, a positive reaction being found in 62 per cent. of all cases, in 47 per cent. of the anæsthetic cases, in 80 per cent. of the mixed cases, and in 100 per cent. of the nodular cases. The possible influence of syphilis in causing the positive reactions was investigated by careful inquiry and examination, which elicited evidence of a previous venereal sore in 49 of the adult cases, but of these 15 gave a negative reaction. If it be assumed that the remaining 34 positive reactions were due to syphilis and not to leprosy, this would indicate a syphilitic rate of 14 per cent., which is about the average syphilis rate of the population. Among the children only four showed lesions suggestive of inherited syphilis, and among these the Wassermann reaction was positive in one case, partially positive in one case, and negative in two cases. On the other hand, a control series of 46 untainted children yielded positive reactions in eight cases, or 17 per cent., which, though not inconsiderable, was within the syphilis rate, and was in striking contrast with the high percentage in the leper children.

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[1] Surgery, Gynecology, and Obstetrics, August, 1923.

[1] Indian Journal of Medical Research, July, 1923.

A VISIT TO MEDICAL SCHOOLS IN CANADA AND THE UNITED STATES.

IN the early part of this year Mr. A. E. Webb-Johnson, surgeon to the Middlesex Hospital and dean of the Medical School, visited the principal hospitals and medical schools of Canada and the United States, the itinerary including Quebec, Montreal, Ottawa, Toronto, Boston, New York, Philadelphia, Baltimore, Washington, Cleveland, Chicago, and Rochester. Mr. Webb-Johnson's observations and experiences, communicated to Mr. S. G. Asher, chairman of the Council of the Medical School, and now circulated privately, form a useful contribution to the study of hospital administration. Visiting the Rockefeller Foundation, Mr. Webb-Johnson found the directors committed to the idea of full-time clinical professorships, but elicited the information that little was being done in America for post-graduates, and that the best post-graduate school in the States was the Mayo Clinic. In Philadelphia efforts are being made to enable practitioners to get away for six months or a year in order to take up clinical assistantships. There is in this city a special hospital of 250 beds called the Polyclinic Hospital, which is reserved for post-graduate study. America it seems is considering further provision for her own post-graduates, a problem widely different from that which confronts us. The American undergraduate in medicine does not receive a prolonged clinical training in touch with patients, but is instructed largely by classes, both clinical and laboratory. After obtaining his degree the American post-graduate still needs the clinical experience which our students get while acting as clerks and dressers. Mr. Webb-Johnson's letter is crammed with entertaining things. At the Johns Hopkins Hospital he found convincing evidence of the great advantages of having special departments properly equipped in a general hospital. In a description of the operations of one well-known surgeon, "who now removes for hyperthyroidism the bulk of both lobes of the thyroid," it is stated that in spite of the many vessels to be ligatured under this procedure the operation takes 10–15 minutes only. Being ambidextrous, this surgeon uses a needle at both ends of a suture and stitches with both hands at the same time. Mr. Webb-Johnson saw another surgeon expose the third ventricle and foramen of Monro under local anæsthesia without shock or obvious sign of distress. At a famous clinic elaborate precautions are taken against leaving a sponge inside the abdomen; black tails are fastened to the numbered gauze pads by metal rings which can be identified by X ray examination. At this clinic a report on sections by the freezing method reaches the operating surgeon within two minutes. In regard to the keeping of records there is better stenographic assistance provided for American surgeons, who are therefore in a better position to follow up results; this, Mr. Webb-Johnson drily remarks, is more important than recording the proceedings of committees. In Chicago the American College of Surgeons issues a daily bulletin as a guide to all the operative work in the city, and has a department—open also to foreigners—"which will dive into the literature of any subject in medicine or surgery and for a reasonable fee supply a complete bibliography, with abstracts if necessary." The reprint contains photographs of Harvard Medical School, Boston, of the Medical Building of McGill University, Montreal, of the Rockefeller Institute for Medical Research, New York, of St. Mary's Hospital and the Mayo Clinic, Rochester, together with charts, schedules, and history sheets used in the various institutions described. British surgeons will find it worthy of study.

PROPHYLACTIC INJECTION OF NORMAL SERUM AGAINST MEASLES.

EIGHTEEN months ago attention was called[1] to the work of Dr. R. Degkwitz, of Munich, who produced an immunity against measles by injections of serum obtained from patients convalescent from the disease, and our Berlin Correspondent has recently brought our account of this work up to date.[2] Dr. Gustav Salomon,[3] in combating a severe epidemic of measles in the Waisenhaus and Kinderasyl in Berlin, found that the supply of convalescent serum was insufficient to fill his demand, and as the epidemic was a particularly severe one, and every child exposed to infection contracted it, he experimented with injections (10–15 c.cm.) of serum obtained from adults who had had measles in their infancy. He had the opportunity of dividing his cases (all of whom had been exposed to infection) into three groups—namely, 60 children untreated, 62 treated with M.R.S. (Masernrekonvaleszenten-serum), and 72 treated with adult serum. Of the 60 untreated cases all (100 per cent.) became infected and 58 per cent. died; of the M.R.S. children more than half (59·7 per cent.) were protected, while 16 per cent. died; and of the adult serum cases 52·6 per cent. remained immune and 13·8 per cent. died. Out of the 44 deaths, 34 were consequent on broncho-pneumonia, and 10 died while the rash was out. Of the cases which recovered 13 developed broncho-pneumonia. This complication therefore attacked in all 47 cases, 28 of the untreated, 13 of the M.R.S., and 6 of the adult serum cases. The course of the disease, when it occurred in those who had received prophylactic injections, appeared in most cases to be much milder, abated more rapidly, and showed a longer incubation period than the untreated cases. The M.R.S. used in this series was obtained from infants under one year, and was probably not so rich in antibodies as that used by Degkwitz, which was obtained from older children. This fact may account for the lower percentage of good results as compared with his. The prophylactic injection of adult serum appeared to give approximately a similar protection against measles with regard to the incidence, mortality, course of the disease, and complications as the M.R.S. used in this series.

THE BRITISH JOURNAL OF EXPERIMENTAL BIOLOGY.

THE development of most of the sciences to which medicine is ancillary appears now to have reached a stage in which they can no longer be served, in the opinion of those best qualified to judge, by adhering to descriptive methods. While the special journals recognise this tendency and devote an increasing number of pages to experimental work, some delay in publication has become inevitable owing to the large number of men attracted to this side of the subjects, and the result has been the genesis of journals devoted exclusively to the publication of experimental work. Of these the *Journal of Experimental Physiology* is perhaps the oldest in this country, having reached its thirteenth volume. The *British Journal of Experimental Pathology* was founded in February, 1920, and the first number of the *British Journal of Experimental Biology* is now in our hands. The managing editor,

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[1] THE LANCET, 1922, i., 591.
[2] THE LANCET, Sept. 1st, p. 476.
[3] Deut. med. Wochens., August 31st, 1923.

Dr. F. A. E. Crew, of the Animal Breeding Research Department of Edinburgh University, assisted by a strong editorial board, will consider original articles on experimental embryology, genetics, animal behaviour, the comparative physiology of the lower organisms, and the results of cytological, morphological, and histological investigations which bear directly on matters of current interest to the experimental biologist. Authors are requested to minimise space devoted to historical introductions and theoretical discussions since authoritative reviews of recent progress in various fields of inquiry will be published from time to time. In the first number a critical summary of Tissue Culture, by H. M. Carleton, gives no less than 55 valuable references, though only "the more important papers have been mentioned," and the author deplores the lack of adequate bibliographical references in many of the articles quoted. It is obvious from his conclusions that many of the fundamental discoveries in this work are due to an English observer. The localisation of the factors restraining, inhibiting, or stimulating the growth of tissues can be approached experimentally through the technique of tissue culture, and such research is in direct contact with the problems of causal embryology and with the cancer problem. The original articles in this issue include Studies on Internal Secretion: II., Endocrine Activity in Fœtal and Embryonic Life, by Lancelot T. Hogben and F. A. E. Crew; Studies on the Comparative Physiology of Digestion, (1) the Mechanism of Feeding, Digestion, and Assimilation in the Lamellibranch Mya, by C. M. Yonge; Parthenogenesis in the Mollusc *Paludestrina jenkinsi* (Part I.), by G. C. Robson; Histological Studies on the Domestic Fowl, (1) A Microscopic Study of Sex-Reversal and Hermaphroditism, by Honor B. Fell. The *Journal* will be published quarterly by Messrs. Oliver and Boyd, Edinburgh, the annual subscription being 40*s*., and we wish it a successful career.

SIR THOMAS BROWNE'S SKULL.[1]

It will be remembered that a peculiar controversy between the Board of the Norfolk and Norwich Hospital, and the vicar and churchwardens of St. Peter Mancroft Church, Norwich, reached a satisfactory conclusion some two years ago. The circumstances were that Sir Thomas Browne, the author of the Religio Medici, who died in 1682, was buried in St. Peter Mancroft, but his skull was stolen from the grave some 160 years later and found its way to the museum of the Norfolk and Norwich Hospital. The vicar and churchwardens of that splendid church, St. Peter Mancroft, were assiduous in attempting to have the skull restored to its original resting place, while the hospital authorities, with a mediæval regard for the relic of a scientific saint, were unwilling to part with the skull. In February, 1922, however, the skull was finally restored to the church, but careful measurements, drawings, and tracings of it were made at the Royal College of Surgeons, so that a memorial might remain of that which is now for ever hidden. There has now been published a monograph on Sir Thomas Browne, dealing especially with the skull in relation to its identity and its verification by portraits written by Miss Tildesley, with an introductory note by Sir Arthur Keith and a report on the endocranial casts by Prof. Elliot Smith. The monograph is a thoroughly sound piece of work. Sir Arthur Keith, who had intended to write it himself, was forced by illness to hand over the task to Miss Tildesley, who has carried it through with enthusiasm and skill—in the words of Sir Arthur Keith, "she has exemplified the best kind of scholarship—one which illustrates the right application of laboratory methods to historical inquiry and to anatomical pursuits." The monograph is profusely illustrated, containing reproductions of the three famous Norfolk portraits, of the portraits at the Royal College of Physicians, London, and at the Bodleian Museum, and beautiful photographs of the skull and the endocranial casts. The scheme for putting on permanent record the physical aspect of the author of the Religio Medici is thoroughly justified. Sir Thomas Browne has won an individual position as author and philosopher, and this monograph should find its way to the shelves of all representative collections. The book has been published by subscription, and we understand that there are still a certain number of copies available to purchasers, who should apply to the secretary of the Biometric Laboratory, University College, London, W.C. The original price of one guinea is being charged for the remaining copies.

SCIENTIFIC EXHIBITS AT THE BRITISH ASSOCIATION MEETING.

Our Liverpool correspondent writes: The British Association meeting this year has an added attraction for the medical profession in its large collection of scientific exhibits. These range from meteorology to practical dyeing, and from preparations illustrating the histology of coal to examples of ultra-modern devices in wireless telephony. Of more direct interest, however, to the medical man are the exhibits of the chemical manufacturers and the scientific apparatus of many kinds for both clinical and experimental work. It is especially noticeable what advances have been made in the production of heat-resisting glass and silicaceous ware. Prices are still high, but are beginning to become more reasonable. It is now possible to buy a good practical Leitz microscope for £18, an oil-immersion lens being £5 extra. A simpler but still useful student's instrument with English lenses can be had for between £9 and £10. Much attention has been paid to the teaching of microscopic work to the student, and some of the apparatus shown would appear to make diagrams—and even lantern slides from actual photographs—things of the past. Two small attachments are exhibited, which enable the teacher to demonstrate a slide directly to the student. One of these is a branched eye-piece, which allows two persons comfortably to examine the same slide at the same time. A movable pointer is an added convenience. Even more practical, and at the same time less costly, is a mirror arrangement which reflects an enlarged view of the field under observation on a sheet of white paper laid near the base of the microscope. Both exhibits can be attached in a moment to any microscope. To the surgeon the instruments produced in stainless steel, though their manufacture is still in its infancy, open up attractive prospects of lessened labour and less frequent necessity for replating, repairs, and renewals. The physician will find the advance of diagnostic methods amply provided for by new instruments of great delicacy and precision, amongst which may be instanced an apparatus for rapidly estimating the reaction of small quantities of body fluids in terms of the hydrogen-ion concentration. There are also to be seen improved and simplified forms of instruments that have already stood the test of time, such as Mackenzie's polygraph. There is a room devoted to the most modern X ray plant that makes its appeal to the clinical worker, as also to the advanced physicist. The visitor comes away with an increased realisation of the part played by the physicist and the chemist in elucidating industrial problems, and an altogether new conception of the rôle of the microscopist in industrial research.

ST. MARY'S HOSPITAL POST-GRADUATE COURSE.

A special post-graduate course, open to all medical practitioners without fee, will be held in the Clinical Theatre of the Unit, St. Mary's Hospital, on Saturday, Sept. 29th, Sunday, Sept. 30th, and Monday, Oct. 1st. On the first day Mr. D. C. L. Fitzwilliams will discuss Early Diagnosis of Carcinoma of the Breast, at

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[1] Sir Thomas Browne: His Skull Portraits and Ancestry. By Miriam L. Tildesley, Research Worker, Royal College of Surgeons' Museum. With 34 plates, frontispiece, and folding pedigree. Reprinted from Biometrika, vol. xv., and issued to subscribers only.

10 A.M. At 11 A.M. Mr. T. G. Stevens will speak on Prolapse, followed by Mr. S. Maynard Smith on Chronic Pain in the Right Side of the Abdomen. In the afternoon, from 2 to 3, Sir William Willcox will discuss Chronic Rheumatic Toxæmia, and from 3 to 4 Dr. Reginald Miller will give a Demonstration of Cases of Cœliac Disease. On Sunday, Sept. 30th, at 10.30 A.M., Dr. C. M. Wilson will deal with (1) The Investigation of Dyspepsia, (2) The Treatment of Diabetes. On Oct. 1st, at 11 A.M., Mr. Aleck Bourne will give a lecture on Anticipation of Mechanical Difficulties in Labour, illustrated by lantern slides. At noon Dr. Wilfred Harris will discuss Encephalitis Lethargica. In the afternoon, at 2 o'clock, Dr. Graham Little will give a lecture on the Diagnosis of Some Common Diseases of the Skin, illustrated by cases, and at 3 P.M. Prof. Frederick Langmead will deal with Some Functional Disorders in Young Children. It will be remembered that a corresponding week-end course initiated last year was well attended; it may be anticipated that this year's course will be equally successful.

ATOMIC PHYSICS.

PHYSICS has always taken a prominent position in the work of the British Association, a fact which is emphasised this year with Sir Ernest Rutherford, Cavendish Professor of Physics, in the presidential chair. There is much for discussion among physicists at the present day, and Sir Ernest Rutherford was happy in the use of such a term as the "Renaissance in Physics" to describe the extraordinary development in atomic physics during the last 25 years. We have to remember that 50 years ago the generally accepted idea of the atom was that of an indivisible unit which could for most purposes be looked upon as a hard elastic sphere. It had to be elastic because it was known to vibrate, and it was just in this respect, with the advances which were then being made in spectroscopy, that the inadequacy of the concept was most acutely felt, for how could such simple elastic spheres be thrown into the hundreds of different states of vibration which their line-spectra necessitated? The discovery of radio-activity upset completely this conception of the atom, and it is probably not overstating the case if we say that the discovery and isolation of the electron, the ultimate unit (at the present date) of negative electricity, by Sir Joseph Thomson has more than any other single discovery led to this overthrow of the older view. And so it comes about that the researches in atomic physics at the present day are largely centred not on the configuration of molecules but on the internal structure of the atom, and it is by a wonderful combination of intuitively directed experiment by Sir Ernest Rutherford himself, combined with the mathematical analysis of Prof. Neils Bohr, that atomic models are being fashioned which will satisfy the various criteria which natural phenomena provide. This trend of modern physics has, among other things, pointed to the relatively enormous amount of energy which is contained in atoms, and speculation upon its availability has not been restricted to the strictly scientific circle. Experiment has shown that by the use of the swiftly flying alpha particles of radium it is possible to penetrate into the interior of other atoms, to cause their disruption, and in this way release more energy than was in the original projectile. There has thus been a gain of available energy, and if such processes could be multiplied in the scale of some millionfold they might take on an economic aspect, although when experiments are undertaken for big scale operations it is frequently found that some compensatory restraining mechanism crops up. It may be so in this case. There can, however, be little doubt that atomic studies are destined to have far-reaching effects on science as a whole; we are left wondering how many years must pass before a future president will discourse to us on the constitution of the "ultimate" particles of to-day, the electrons and protons which form the bricks of the atoms whose inner structure is the revelation of the present century.

Modern Technique in Treatment.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

XXXVII.

TREATMENT OF CHRONIC ARTHRITIS.

THE crippling forms of arthritis are among the major causes of ill-health, and through their interference with working capacity account for an enormous economic loss. Three main groups can be differentiated—rheumatoid, osteo- and peri-arthritis. Whilst typical examples of each present distinct clinical and pathological pictures, there are cases difficult to classify and others in which more than one type is seen in the same patient. From the point of view of treatment they can be considered together, points of difference being mentioned as they arise. In all, the joint lesions are local, and often late, manifestations of a general disorder. In rheumatoid arthritis, cramps, tingling and numbness of the extremities, "dead fingers," slight signs of hyperthyroidism, and vasomotor instability may precede the arthritis by years. The subjects of peri-arthritis have usually had fleeting attacks of fibrositis elsewhere before the disease settled in the joints. With osteo-arthritis, villous synovitis of the knees or hips or a dry crackling without joint enlargement may precede the formation of osteophytes, and the appearance of Heberden's nodes on the fingers should suggest the possibility of later and more severe lesions elsewhere. Much crippling and suffering could be prevented if these early symptoms were regarded more seriously and search for the underlying infection were made before the establishment of permanent organic changes.

Treatment of the Infection.

Much emphasis has been placed upon the connexion of focal infections with arthritis. In true rheumatoid arthritis these seem to play but a small part, and infection should be sought in connexion with some mucous surface from which widespread absorption can take place. Many patients show defective ferment action, hypochlorhydria, stasis, and an abnormal growth of intestinal streptococci. The "chronic abdominal" type of patient is well represented in rheumatoid arthritis. The urine may give evidence of alimentary absorption in the shape of streptococci, *B. coli*, and oxalate crystals, and a chronic pyelitis may be present. Chronic bronchitis and uterine infections are less common forerunners, but in some patients all mucous surfaces are unhealthy, and suggest lack of resistance to invasion by the normal bacterial inhabitants. Subinfection leads to hyperthyroidism and lowered sugar tolerance, and these in turn aid further infection. In fibro-arthritis, osteo-arthritis, and gouty arthritis, on the other hand, a careful search for focal infections should be made. The rôle of the teeth has been much exaggerated, and one must protest against indiscriminate and wholesale extraction of the teeth of arthritics. Periapical infections and deep-seated pyorrhœic lesions are important; the open sepsis of simple pyorrhœa is less serious unless there be hypochlorhydria, when the swallowing of septic matter may eventually lead to gross infection of the small intestine. The extraction of teeth requires careful and anxious consideration in consultation with a skilled dentist. In simple pyorrhœa much can be done by scaling, massage of the gums, and strict cleanliness. Removal of septic tonsils may be required; small scarred tonsils are often more dangerous than hypertrophied ones. Enlarged and tender glands beneath the angles of the jaw are good evidence of septic absorption, and the urine may show streptococci of a similar type to those isolated from the mouth or throat or other organisms. The antra and nasal sinuses and the naso-pharynx require careful examination. Gonorrhœa may have opened the path to a secondary streptococcic infection which alone persists and requires treatment. The alimentary tract must be examined for stasis, ulceration, and catarrhal inflammations. Chronic appendicitis or cholecystitis must be considered. Organisms may be grown from the washed mucus from the stools or obtained from the duodenum by a tube. Washing out the small intestine by a saline purge after feeding for a few days with lactose may provide active culture material. A very thorough clinical and bacteriological examination has thus to be made in every case and the results assessed. Only in early cases with one or two accessible foci of infection will removal alone cause improvement; but in later cases we may at least reduce the amount of subinfection.

Vaccine treatment is employed to raise the resistance of the patient to the infection whatever its source. The initial dose should not exceed five millions, and should be very gradually increased, injections being made every five to seven days. That dose which is just below that necessary to produce a reaction should be aimed at. Much vaccine treatment of arthritis is ineffective because it is stopped too soon, with too small a final dose; 1000 to 2000 millions may be reached by careful intensive treatment.

Intravenous Protein Therapy.—The use of intravenous injections of proteins has added a definitely useful agent to our therapeutics, the mechanism of action being somewhat obscure. My own experience has been chiefly with albumoses, typhoid and *B. coli* vaccines, these latter being used purely as a source of protein. With typhoid or *B. coli* vaccine a suitable initial dose would be 30 millions, injections are given every fifth day—usually not more than six in all—the dose being gradually increased according to the effect, up to 200 millions, the dose varying with the patient and the activity of the vaccine. With albumoses I find 0·2 c.cm. of a 5 per cent. solution of Armour's peptone, No. 2, gives a satisfactory response. The injection is followed in a few hours by a rigor and a rise of temperature to 102°F. or thereabouts. During this negative phase there is a focal reaction in the joints with increased pain, followed by defervesence, sweating, and a positive phase in which the joints are less painful and stiff and the patient experiences a sense of well-being. In subacute cases of multiple periarthritis the result may be remarkable; rheumatoid and osteo-arthritic lesions show less improvement, but even here this treatment combined with vaccines yields better results than do other methods. The patient willingly bears unpleasant immediate effects for the sake of the after improvement, and the shortened period of treatment is also of advantage from the hospital standpoint. Intravenous protein therapy should not be used with old and feeble patients or those with myocardial disease.

General Treatment.

Clothing.—Most arthritic patients are overclothed. Layers of heavy woollen clothing keep the skin in an unhealthy, moist, unduly warm condition. Silk or cotton mesh, frequently changed, is preferable.

Climate.—The desirability of a warm, dry climate and of residence on a gravel or sandy soil has been exaggerated; no climate will be found suitable so long as the infective causes remain. Abundant sunshine is of more importance; heliotherapy where tried has given hopeful results.

Diet.—Sugars and soft, starchy foods should be restricted. Rheumatoid patients require a gradual introduction to a generous diet with milk, eggs, meat, abundant fats, and fresh, tender vegetables. Stout osteo-arthritics require a reducing diet, with milder proteins and abundant vegetables. Hot water should be taken before meals, and no fluids with them.

Local Treatment of the Joints.

During the acute phases the joints should be kept at rest *in a proper position.* The majority of advanced cases have their joints fixed in bad positions, brought about in the earlier stages by attempts to get the joints into the position of greatest ease, which is usually that of flexion; as a result adaptive shortening of flexors and stretching of extensors occurs with ankylosis of the joints. Knees and hips should be fixed in extension, if necessary by the use of weights. The elbow should be at right angles and the wrist somewhat hyper-extended. If the patient is unwilling to stay in bed for slow extension by weights he may wear one of the excellent mechanical contrivances which cause traction and take the weight of the body off the joints.

Relief of Pain.—In the early stages some relief of pain will be brought about by the rest and extension. Further relief can be obtained by the application of dry heat, preferably radiant heat. A small lamp with a parabolic reflector, such as that made by the General Electric Company, Moor-street, Birmingham, or the "Thermolite" lamp by Menley and James, is convenient. Hot sand packs provide a homely substitute. After the heat, analgesic applications such as camphor and menthol or methyl salicylate can be applied. The muscles should be gently massaged, but the joints themselves must not be rubbed.

Duration of Rest.—It may be that the best that can be done is to leave the patient with a quiet joint ankylosed in a good position, but more often the question arises—How long should the joint be at rest? No definite rule can be given, but when the temperature is normal and the pain and swelling have subsided changes in position can be made, followed by gentle passive movements. With further improvement active movements are commenced, and the patient must be encouraged to use his joints. Later on we have to deal with stiffness and possibly contractures by stimulating liniments of camphor and turpentine, and by iodine and mercury. This is also the time for hydrotherapy in its various forms and the skilled bathing and massage to be obtained at spas will help to increase mobility. At home the patient may be trained to react favourably to cold baths of graduated temperatures, radiant heat being continued. Ionization may be of use by warming the tissues and stimulating metabolism; diathermy is also of great value.

Orthopædic Treatment.—Patients with partially or completely ankylosed joints may need manipulation under anæsthesia; this requires extreme care and should not be attempted so long as there are signs of activity. There is grave risk of fracturing the bone or rupturing blood-vessels and nerves. When the joint is reduced ankylosis is again allowed in the best position. In a few cases arthroplasty may be possible, especially in cases of ankylosis of the jaw, fixation of the elbow in extension, and ankylosis of several joints in the same limb Complete bony ankylosis gives better results than painful fibrous ankylosis; young adults are the best subjects. Much judgment is required in selecting cases for operation, and prolonged after-treatment is essential.

Drug Treatment.—No drug has a specific action on arthritis; guaiacol carbonate, guaiacum and sulphur, iodides, arsenic, collosol sulphur, and collosol iodine have their advocates. Drug treatment is mainly symptomatic. With rheumatoid arthritis, ac. hydrochlor. dil., min. 20, well diluted after food helps to correct the hypochlorhydria and intestinal infection. Liquid paraffin, collosol kaolin, and dimol may be used for intestinal stasis together with a proper fitting abdominal support. Thyroid is of great value in advanced rheumatoid cases with hypothyroidism and the osteo-arthritis occurring at the climacteric. In acute fibrositis saline diuretics should be used. Hæmatinics can be prescribed for anæmia. Acetosalicylic acid is useful, but is apt to be abused. For catarrhal conditions of throat and nose an atomizer with collosol argentum may be used several times a day and the tonsils swabbed with 10 per cent. argyrol.

The future of these cases is not so hopeless as was once thought. In most cases improvement can be brought about and sometimes the results of treatment are brilliant. No disease requires more patience and perseverance, and the suggestive therapeutics of hope and confidence are more valuable than drugs.

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Special Articles.

THE INTERNATIONAL HEALTH OFFICES.

PROPOSALS FOR NEW USEFULNESS.

THE Assembly of the League of Nations, in the intervals of its political preoccupations and anxieties at Geneva, has before it the important proposals of the representative Commission of official public health experts, presided over by Dr. A. Granville, President of the Maritime and Quarantine Board of Egypt, which was appointed in the spring to advise on the lines on which the League's Public Health Organisation should be permanently established.

The Basis of Permanent Organisation.

Hitherto the health work of the League has been conducted by a Provisional Health Committee nominated by the Council and representing ten European and four non-European countries, and by the public health section of the Secretariat of the League, under the directorship of Dr. L. Rajchman. This organisation has carried on its work side by side with the older international public health office in Paris—the Office International d'Hygiène Publique—established by the Convention of Rome, 1907, to which certain countries not members of the League—notably the United States—are parties. The members of the League's Provisional Health Committee are in the majority of cases also the official delegates of their countries to the Paris office, and consequently have been able in large measure to secure that the work of these two international organisations has not unduly overlapped. Moreover, each of the two Presidents, Dr. Madsen (Denmark) and M. Velghe (Belgium), is a member of the other's organisation. All the same, it has become evident that, if two official international health organisations have for the present to be maintained as the result of political and other circumstances, something must be done to coördinate their work, officially and formally, and to establish principles on which the utilisation of the Paris office and the Paris International Committee on the one hand, and the Geneva office and Health Committee on the other, can be naturally and automatically determined. The Third Assembly of the League decided last year that international public health should in future be undertaken as part of the permanent activities of the League, and in working out the details during the present Assembly the League has a great opportunity of getting the desired coördination established by general consent. The report of the Granville Commission proposes that the official Government delegates to the Office International in Paris (who constitute the Standing Committee of that body) should undertake the duty of acting as the General Advisory Body on which the League would rely, and should also accept the duty of nominating the greater part of a Standing Health Committee of the League itself. These proposals keep intact the functions of the Paris office as established under international convention, and, incidentally, have the advantage of basing the medical work of the League on an existing organisation on which the public health services of any country in the world can readily be represented. In effect, they would secure that the regular Committee of the Office International d'Hygiène Publique, which has good work and official experience to its credit, will in future be greatly strengthened through the fact that, subject to the Council of the League of Nations, it will obtain an executive body, able to carry out approved international investigations with the resources of the League behind it—an important consideration when it is remembered that the small budget of the Paris office is limited by its statutes to a sum far smaller than is necessary for effective international work.

A Wealth of Publications.

Consideration of the administrative questions which are now before the Assembly as a result of the report of Dr. Granville's Commission, recalls the magnitude and number of the official international publications which have been appearing for the last two or three years. In addition to the monthly published Bulletins of the Office International d'Hygiène Publique, we now have twice a year the Minutes of that office, which sits in Paris for ten days in May and October, and also the Proceedings of the Provisional Health Committee of the League of Nations, the most recent of which, that of the Sixth Session, has just been issued as a volume of 126 folio pages (League of Nations document C. 424, M. 187), obtainable from Constable and Co. The Health Section of the Secretariat of the League has also issued a number of separate reports on particular conferences and missions, and on epidemic diseases in Eastern Europe. It also publishes a monthly "Epidemiological" Report compiling current returns of notifiable diseases in different parts of the world, which have been gathered together by a sub-department concerned with "Epidemiological Intelligence and Public Health Statistics," directed by Mr. E. Sydenstricker and financed by the Rockefeller Foundation. Study of these various documents provokes the immediate reflection that the coördination desired by the Granville Commission is already badly needed. Few subjects are to be found which are not being treated both by the Office International d'Hygiène Publique and by the Health Committee of the League from their respective points of view, and much cross reference is necessary if the experience of any particular country or the views of any particular delegate are required. It is to be hoped that this is only an incident in a useful evolutionary stage of the development of official international health work. Certainly the publications as a whole leave no doubt of the great progress which has been made at Paris and at Geneva in developing machinery by which the various public health services of different countries are brought together for comparison of data, and for international agreements on matters which require them. Both series of reports, with their wealth of reference, should find a place, together with the monthly Bulletin of the Office International d'Hygiène Publique, in every public health library. It should be understood that the notes below merely illustrate certain sections of the work which is recorded in the most recent of these publications.

International Differences in Cancer Mortality.

This subject was introduced to the Paris office in October, 1922, by Sir George Buchanan, the British delegate, and was made the subject of a preliminary questionnaire, the results of which were reported in May by the same delegate in conjunction with Dr. Major Greenwood, Medical Statistical Officer of the Ministry of Health. The questionnaire was designed as a preliminary inquiry by which the material available for statistical investigation in each country could be ascertained. It appeared that there was unanimity of opinion that cancer is an increasing or, at the least, a non-diminishing cause of mortality in all the civilised nations represented. This opinion was not vitiated by the universally recognised fact that statistical ratios of mortality are liable to various errors of record, some generally applicable and others special to the circumstances of particular countries. The importance of comparative study and analysis of hospital figures is fully recognised, but it is concluded that no country can so far be said to provide records of hospital mortality suitable for the purpose. Notable inter-local differences of mortality have been established in certain countries, in particular a relatively high mortality in the centre part of Sweden as compared with the rest of that country, and in the departments of Emilia and Toscana as compared with the rest of Italy. The constancy of this localisation extends over a considerable period of time, and is not, in the opinion of the reporters, to be accounted for as a matter of record. Recorded cancer mortality shows a very high variation even between the countries in which death certification and registration are most highly developed. This, however, does not carry with it corresponding variations in the rates of mortality at adult ages from all causes. Italy, for example, which has a much lower mortality from cancer than England and Wales, Holland, Norway, and Sweden, has a smaller mean expectation of life at ages 30 and 60 than any of these countries.

Sir George Buchanan and Dr. Greenwood emphasise the value which the replies of the different countries to the questionnaire regarding the nature of the material available for study possess for permanent reference; these replies have now been published in the June and July numbers of the *Bulletin* of the Office International d'Hygiène Publique. It is considered that they will afford a directory and an index indispensable to those who are undertaking international comparison of cancer figures in one or another direction. The reporters suggest one such international comparison as a starting-point, and emphasise the practical value of selecting and concentrating on definite parts of the statistical field. Taking three countries in which registration of causes of death has long been well developed, they present the following contrast between England and Wales, Italy, and Holland :—

Cancer Mortality of Special Sites Expressed as Rates per 10,000.

—	Cancer of the breast (female).			Cancer of the female genital organs.		
	England and Wales.	Italy.	Holland.	England and Wales.	Italy.	Holland.
1911	1·84	0·58	0·98	2·43	1·48	1·17
1912	1·97	0·55	1·19	2·46	1·40	1·27
1913	2·02	0·59	1·08	2·55	1·50	1·40
1914	1·99	0·59	1·10	2·50	1·51	1·31
1915	2·02	—	1·12	2·46	—	1·32
1916	2·11	0·56	1·15	2·47	1·49	1·22
1917	2·13	0·56	1·10	2·56	1·40	1·30
1918	2·07	—	1·12	2·54	—	1·34
1919	2·20	—	1·27	2·55	—	1·44

These are very striking differences, the meaning of which it ought to be possible to ascertain by a carefully planned inquiry, and it is satisfactory to note that the consideration of this report by the Paris office, and subsequent reference of the subject to the League of Nations Health Committee, has led to the appointment by the League of an international committee authorised to coöpt experts and prepare a scheme for the necessary investigations.

Comparative Data in Other Diseases.

A similar collection of information regarding the prevalence of goitre and its treatment, in the hands of Dr. Carrière, the Director of the Swiss Public Health Service, is in progress. In the enteric group the Paris minutes contain instructive contributions from the representatives of some of the Eastern European States such as Roumania and Bulgaria, illustrating the large extent to which wholesale antityphoid vaccination has lately been adopted to combat these diseases among the civil population. The reports contain many references to the present position of epidemic typhus. A notable feature of this disease in Algeria has been that a recent migration of the population from the villages to the towns as a result of drought has led to a very great increase of typhus of the severe type. Figures illustrating the vast extent of recent typhus in Russia are given in the League of Nations volume and in the special epidemiological reports. It is still impossible to obtain any check on these figures, which relate to cases of the disease, by a study of the corresponding deaths, no death returns under causes being available in Russia. There seems to be no doubt, however, that typhus at length after many years shows definite evidence of diminution, while fortunately through a number of circumstances the intensive infection brought into Poland and other countries to the west of Russia, as a consequence of the movements of refugees and repatriated persons from Russia, has virtually stopped. To this fact may be attributed a great reduction in the number of typhus cases in Poland during the past winter, where the weekly number of new cases reported never passed a maximum of 500. In connexion with relapsing fever, which has accompanied these European epidemics, it is interesting to refer to a report to the Office International d'Hygiène Publique by Dr. Gouzien on an outbreak of this disease affecting large tracts of Senegal and French Gambia. It was estimated that since 1919 as many as 80,000 deaths have occurred from this cause. Treatment by injections of "914" were found very effective, but appeared to have the disadvantage of reducing the resistance of the patient to subsequent infection. An account was also given to the Paris office by Dr. Lutrario, the Italian Director-General of Public Health, on an outbreak of ictero-hæmorrhagic spirochætosis of Ronciglione in 1921, causing an epidemic of 800 cases, which terminated by the occurrence of chronic sickness characterised by inguinal buboes.

Malaria and Sleeping Sickness.

The League of Nations Health Committee has recently decided on special investigations in connexion with both these diseases. In May last the British member presented to the Committee a note from Lieut.-Colonel S. P. James, adviser on malaria to the Ministry of Health, in which the great increase of malaria in some of the endemic centres in Europe during and since the war was considered, and a plea was put forward for study of the circumstances responsible for the spread of the disease in the different countries affected. Such an investigation would probably show that some of the preventive methods commonly recommended on tropical experience are not the most effective or most economical for the affected countries in Europe. In many of them only a small amount of money is available for preventive measures; it will not be practicable to employ several systems at the same time, and investigation is needed to determine the one likely to be most effective in the particular instance and concentrate on it. Recent observations in France, Denmark, Holland, and England on the causes of the disappearance of malaria from those countries, and of the failure of the disease to spread in them after the war, may have a very practical bearing on this subject, while thorough inquiry is needed from the point of view of economy into the utilisation of quinine. Following this note the Health Committee appointed a Commission under the direction of Dr. Lutrario with power to coöpt malariologists and undertake local inquiries and other research work. This Commission has the task of collecting and examining information with regard to the epidemiology of malaria and the prophylactic measures adopted, as well as of advising the health administration of different States which may apply to the Commission for assistance.

The inquiry into sleeping sickness in tropical Africa is in the hands of another Commission of the League, consisting of Dr. Andrew Balfour, Dr. Van Campenhout, and Dr. Martin, to which body Dr. Bagshawe, Director of the Tropical Diseases Bureau, London, has now been added. On behalf of this Commission, Dr. Balfour has now presented to the Health Committee a report representing the information available from various sources as to the incidence and distribution of sleeping diseases in the African countries concerned. This report will shortly be published from Geneva. It indicates the need of close practical coöperation between the Egyptian Sudan, Belgian Congo, and French Equatorial Africa on account of the spread of the diseases within those regions and from one country to the other.

International Agreements and Questions of Standardisation.

The minutes of the May meeting of the Office International d'Hygiène Publique show that the proposals for revision of the International Sanitary Convention, 1912, to which so many sessions have been devoted, are now completed and in the hands of the French Government for negotiations with the various powers in order that the final form of the next Convention may be settled by a general International Sanitary Conference. The need for a revised Convention becomes daily more evident, and there will be general satisfaction among those who are responsible for measures of port sanitary administration and quarantine when the date of the Conference is definitely fixed. A minor but collateral question, lately considered by the Health Committee of the League, is that of the international arrangements to prevent carriage of infection that should be made between riparian states which are traversed by large navigable waterways such as the Danube. An annexe to the minutes of the sixth session of the Health Commitee contains a draft model convention for the health control of traffic on waterways prepared with this object by Dr. Chodzko (Poland) and Dr. Lutrario (Italy). Other questions of regularising international practice in the interest of public health and shipping, some of which may require to be included in official international agreements, are those of flags and signals which should be used for various purposes of quarantine, the scope and form of bills of health, and the methods which should be officially considered adequate for the destruction of rats on ships. All these subjects, and in particular the increasing adoption of hydrocyanic acid gas for rat destruction, were fully discussed at the last session of the Office International d'Hygiène Publique, which also received a useful note prepared by Dr. J. A. Mitchell, the chief health officer for the Union of South Africa, on the use of wireless messages in quarantine work.

Another class of work for necessary standardisation must be mentioned. As is well known, the League's Health Committee, through the energy and activity of its President, Dr. Th. Madsen, has already secured some most valuable and practical agreements between bacteriologists and administrators for the unification of certain antitoxic sera and serological tests. The conclusions of the Serological Conferences held at Paris and Geneva on the subject, under the auspices of the League, have already been fully reported, and various joint laboratory investigations which were there decided upon are now being pursued. This year a further step was taken, again on Dr. Madsen's initiative, to obtain an international understanding regarding the units of strength and the methods of testing which should be applied to biological remedies or to drugs which, like digitalis, require to be standardised by biological means. A special conference of physiologists and pharmacologists on these subjects was arranged by the League in Edinburgh in July at the time of the International Physiological Congress. Further publications will be issued from Geneva on these two branches of work, and in both British scientists, acting through the Medical Research Council and otherwise, have fully participated.

Special Activities of the Geneva Health Office.

The provisional health organisation of the League administers the special fund raised for the anti-epidemic measures in Eastern Europe which have been carried out by the League's Epidemic Commissioners. This fund is nearing exhaustion, but owing to the receipt of £5000 through Dr. Nansen, in the early part of this year, it was found possible for the Commissioners to accept the invitation of the Greek authorities and undertake an intensive campaign for the vaccination of the refugees swarming into that country from Asia Minor and Thrace. A very instructive account of this campaign is given in the minutes of the Health Committee in the form of reports submitted by Dr. Rajchman and Dr. Wroczynski. Within two or three months some 700,000 vaccinations were performed against small-pox and 975,000 inoculations of tetravaccine against the enteric group and cholera were given. The whole work appears fully to have merited the special commendation which it recently received from the Council of the League. It may be added that a general investigation of public health problems in the Far East is now being undertaken by Dr. F. Norman White, the Chief Epidemic Commissioner.

The other special funds at the disposal of the League's health organisation—those given by the Rockefeller Foundation—have fortunately not only been continued, but have recently been increased by a special contribution for international statistical services. With the aid of these funds a bureau with a large staff has been formed at Geneva for epidemiological and statistical studies, while considerable progress has been made with the various schemes of "interchange" between the public health and laboratory officers of different countries. The courses of instruction for foreign medical officers of health already held in Belgium, Italy, and Great Britain are now being continued by a course in the United States, and the programme of 1924 covers a second British course, and others in Holland, Switzerland, and the Scandinavian countries. What are termed "specialist" interchanges are also being arranged for tuberculosis and school medical officers; a special course in regard to antimalaria work has already been held in Italy with useful results.

From the above examples it may be concluded that if the present movement for better coördination and consolidation of the work of the two international health offices takes shape, those who are concerned with their future direction will be in no need of a fresh programme. The little group of Government health representatives of different countries, which has laboured so hard at Paris and Geneva to show the practical advantage of international coöperation, has already successfully opened up new and promising lines of progress in practical hygiene, and the coördination should be welcome, perhaps not so much for its opportunities of further increasing the number of medical subjects considered internationally, as for providing means by which the various studies and projects for international arrangements which have now been started can be steadily pursued and brought to satisfactory conclusions.

VIENNA.

(FROM OUR OWN CORRESPONDENT.)

The Census Figures for 1923.

THE census returns of the Austrian Republic, taken on March 27th of this year, give the total population as 6,526,661. Of these 3,382,568 are females and 3,144,093 are males. The female population has thus reached again the figure of the year 1910, whilst the males still number 141,255 less than at that date. The excess of females is 76 per 1000 males—a higher figure than in 1910, but a lower one than in 1920. Whilst in the rural districts there is an increase in the numbers of both sexes over the 1910 figure, in Vienna and the industrial districts the population has decreased. In three counties only the females have exceeded the figures of 12 years ago. The female population has increased everywhere at a more rapid rate than the male. The ratio of males to females is highest in Wienerneustadt, 1000 : 1003, and lowest in Baden, 1000 : 1268. The birth-rate for the years 1919–21 stands at 17·96, 22·40, and 25·10 per 1000 respectively, while the death-rate figures for the same period are 20·33, 18·97, and 17·06 per 1000. The effects of the war on the census figures are slowly being obliterated. This is also noted in the public elementary schools. Whilst in 1920 the number of children in the first standard of the lowest forms was 20 per cent. less than the previous year, and in 1921 it decreased still further, this year a rise of over 15 per cent. is recorded. These are the children born in 1917, when part of the army had to be sent back home owing to unrest in the front lines; their return home resulted in a rise of the birth-rate. The improved care of the newborn and the young children up to 6 years has caused a marked drop in the mortality figures of these age-periods, so that relatively more children have reached the school age. In the higher forms of the schools the number of children is as yet much lower than in the last five years.

Suppression of Venereal Disease: Police Suggestions.

At the recent international meeting of the police, which took place in this city, reports were made having a bearing on medical subjects. A suggestion was made by the head of the Vienna police to abolish the control of prostitution. He advocates strongly compulsory treatment of all persons, both male and female, found suffering from venereal disease. It is interesting to note that this demand has been brought forward in several instances by medical men at meetings of preventive societies, and that in the Austrian National Assembly's archives there are deposited several Bills dealing with this matter, but which had to be shelved owing to adverse public opinion.

BERLIN.

(FROM OUR OWN CORRESPONDENT.)

Care of War Victims.

DURING the war and after the German Government, no less than other belligerent Governments, had a heavy burden to bear in the caring for the wounded and providing for the families of the fallen. According to a report recently published, the total casualties in the army and navy amounted to 1,846,293 killed and 4,247,864 wounded. The care of the disabled was formerly entrusted to the local military authorities—the so-called Bezirkscommandos, who in addition had many other duties to fulfil—e.g., the control of the conscripts and the reservists, under the supervision of the War Office. When this military organisation was abolished under the Peace Treaty, the care of the disabled was transferred to the Ministry of Labour and was dealt with by special district offices—Versorgungsämter. Up to the present these offices have settled the claims of 1,537,000 injured and of 1,945,000 dependents. Under the former system the disabled man received his pension and had himself to provide treatment, but the present law provides for the free treatment of disablement due to war service. This enables any one case to be studied as a whole and ensures continuity of treatment. The treatment is, as a rule, carried out by a benefit society; for those who are not members of such societies the Government has appointed medical officers. There are still 70 military hospitals in use throughout the country, and these are given over to the care of the injured. In the German spas the Government have 16 sanatoriums at their disposal, nine of which belong to the Treasury, the others having been taken over temporarily. Private accommodation for invalids is also available in numerous health resorts and spas. In 1922 some 14,500 patients were sent to these institutions. In the tuberculosis sanatoriums 2700 beds are reserved for war victims. In 63 towns and districts there are centres for orthopædic treatment, and necessary appliances, &c., are supplied to patients. A great number of medical officers who formerly belonged to the Army Medical Corps are now attached to the Versorgungsämter.

Accidents Due to Drunkenness.

Dr. Mühsam, chief surgeon to the Moabit Hospital in Berlin, states in the *Vossische Zeitung* that the number of accidents due to drunkenness has greatly increased. He points out that the spread of drunkenness which has grown of late in Germany might well be combated not only by the Government but also by the benefit societies and workmen's insurance clubs, which are called on to pay the costs of treatment, already very high, in such cases of accident.

Height and Weight in Children.

The German Health Office published the results of an inquiry into the height and weight of school-children taken during a period from 1913 to 1922 in the cities of Stuttgart, Leipzic, Munich, Augsburg, Mannheim, Freiburg, Mulhouse (Thüringen), Königsberg, and Spandau. These cities differ much in size and are situated in different parts of Germany. The statistical tables show that boys are taller and heavier than girls of the same age, except at the time of puberty from the eleventh to the fifteenth year. The pupils of the secondary schools are much taller and heavier than the pupils of the elementary schools. The children lost greatly in weight and in size during the war. In Stuttgart the average weight of boys of 10 years fell from 27·9 to 25·7 kg., but this loss had disappeared at the last period of the inquiry which ended in the spring of 1922. It is, however, to be feared that as the supply of food has become again scarce the weight of the children may soon be reduced once more to the war-time level.

Treatment of Tuberculosis.

Prof. Dührssen recently read a paper before the Berlin Medical Society on a new treatment of tuberculosis by inhalations discovered by Prof. Weniger, a German medical man residing in Rio de Janeiro, Brazil. The remedy consists of a mixture of uranium, thorium, manganese, and certain acids which form a new compound, called nitoplasmin. By permeating the capsule of the tubercle bacilli it destroys the toxic and infectious substances, and further it strengthens the immunising substances within the body cells. The daily inhalation of Weniger's compound has no obnoxious or disagreeable effect, the patients, on the contrary, state that they are able to breathe more freely; the sputum first increases, but the discharge is easier and the general state improves, so that they are able to work again. This change was especially notable in graver cases. The condition of the lungs showed an improvement, even at the end of three weeks. Every case was examined before and after the cure by radiographic and bacteriological methods. Dr. Dührssen stated that during his stay in Rio de Janeiro he had seen hundreds of patients who had been cured by Weniger's method within a few months. His own experiences had also been very satisfactory, and he recommended the treatment to the profession.

Public Health Services.

REPORTS OF MEDICAL OFFICERS OF HEALTH.

THE following table gives some of the principal health statistics of the city of Leeds and five county boroughs. If it is justifiable to group the first three as dirty-aired towns and the last three as comparatively clean-aired towns, it is suggestive that the average death-rate of the first group from disease of the respiratory system with influenza is 2·3, while that of the second group is 3·8, and that the difference is greater than the total tuberculosis mortality rate in any of the six towns.

Name of town.	Estimated population (R.G.)	Birth-rate.	Death-rates per 1000 of population.				Death-rates per 1000 births.		
			All causes.	Tuberculosis.	Cancer.	Respiratory with influenza.	Infant mortality		Maternal mort. in childbirth.
							Legit.	Illegit.	
Leeds C.	466,700	19·8	13·9	1·4	1·3	2·9	97	166	3·4
Wigan C.B.	91,750	22·4	14·2	1·2	0·6	4·0	108	93	3·0
Bury	57,400	16·5	14·9	0·9	1·2	4·4	71	274	6·3
East Ham	145,800	21·0	11·0	1·2	1·2	2·7	61	148	1·6
Derby	132,400	20·8	11·3	1·1	1·2	2·2	68	144	4·0
Bournemouth	81,500	13·8	14·0	1·2	1·7	2·0	53	100	5·3

C.=city. C.B.=county borough.

Leeds.

Dr. J. Johnstone Jervis reports that owing to the numerous conversions of premises into flats (55 houses were converted into 260 flats in 1922), Regulations for underground sleeping rooms under Section 17 of the Housing Act of 1909 have been adopted and submitted to the Ministry. The control of common lodging-houses has been transferred from the Watch Committee to the Health Committee. Application will shortly be made to the Ministry to extend the definition of offensive trades to include fried-fish shops and rag and bone dealers. The local Fish Friers' Association approve the former proposal as they are anxious to have the unsuitable premises brought up to the high standard of the majority. Dr. Jervis, in dealing with the smoke nuisance, says the railway companies are among the worst offenders. Lectures for stokers were arranged at the Technical School in November and December, and were well attended. Out of about 7000 observations (one hour each) of chimneys during 1921 and 1922, there were 556 cases where chimneys emitted dense smoke for three minutes. There were no prosecutions in either year.

The Milk Order has met with a poor reception so far in Leeds, licences having been issued to one retailer for "certified" milk and to one for "pasteurised." The two corporation farms have, however, recently been licensed for grade A (tuberculin tested) milk and supply two sanatoriums, the Infants' Hospital, the residential nursery, and the one remaining day nursery (the other three day nurseries having been closed as unnecessary). About 10 per cent. of the milk samples were returned as adulterated. The inspection of cow-sheds shows that the country cows compare very unfavourably with the city cows for cleanliness. Dr. Jervis comments on the culpable negligence shown in protecting meat, bread, fish, fruit, &c., from contamination. Mussels from Lytham and Hoylake are excluded from the Leeds market on account of sewage contamination. There is urgent need for more hospital accommodation for acute bronchitis and pneumonia. Another need is an increase in the ambulance service, for dealing with maternity cases amongst others.

The percentage of persons abandoning treatment at the V.D. clinic before cure is complete reached the low figure of 7·8 in 1922. Dr. Jervis is very dissatisfied with the tuberculosis scheme and does not think the reduction of the tuberculosis death-rate from 1·74 in 1913 to 1·40 in 1922 is a result commensurate with an expenditure of £116,444 during the last ten years. Other people might think the expenditure well worth while if they could feel assured the reduction was due to it. Dr. Jervis goes on to say that if half the money spent on tuberculosis were spent on slum clearance and better housing the result would be much more satisfactory. Well, the Government is now offering Leeds £2500 a year for 20 years (total £50,000) towards slum clearance, to which Leeds will presumably add a like amount, making a sum in all not far short of half the Leeds tuberculosis expenditure. However, it is futile to talk of scrapping tuberculosis expenditure altogether, and Dr. Jervis recognises this when he says "A proper sanatorium built on up-to-date lines is badly wanted," and welcomes the gift of "The Hollies," a mansion which will accommodate 50 children and "be a valuable addition to the general scheme for the treatment of tuberculosis in the city." At the same time everyone will sympathise with Dr. Jervis's desire that more should be done to strengthen the resistance of contacts and to secure the complete convalescence of children after debilitating illnesses "by the establishment of recuperative centres and preventoria up and down the whole country."

Wigan.

Dr. Henry Whitehead is able to report that the scheme for conversion of privies and pail-closets to the water-carriage system has been begun and that great progress has been made in dealing with insanitary houses. Proper receptacles are needed for house refuse, up-to-date vehicles for its removal, and Dr. Whitehead emphasises the need for watering the streets before sweeping in dry weather. The construction of a public slaughter-house is under consideration. An inspection of the gathering grounds of the Wigan water-supply has revealed sources of pollution. Chlorination has been adopted for two of the three supplies and steps to prevent the pollution are being considered. Two additional maternity and child welfare centres have been established. Advantage is to be taken of the Government-assisted scheme for dealing with unhealthy areas, and two such areas are at present being carefully considered. Dr. Whitehead's school report shows that many things are lacking. There is no arrangement for the treatment of tonsils and adenoids. A residential open-air school and an open-air day school are needed and either a special school or more special classes in order to carry out the statutory requirements for the education of mentally and physically defective children. An additional school clinic is wanted. There is ample work for a whole-time dental surgeon, but the school dentist at present only gives three half-days a week to inspection and treatment. A recently completed inspection has shown that the sanitary condition of the schools leaves much to be desired.

Bury.

Dr. G. Granville Buckley shows that the phthisis and infant mortality rates were the lowest ever recorded. He issues a warning as to the neglect of vaccination. At present only one child out of every five born is vaccinated. Bury is setting an example to the mill towns in smoke abatement. There were two prosecutions, one of which resulted in a £5 penalty, the other being dismissed. In over 4 per cent. of the chimneys observed, black smoke was emitted in excess of the limit of 2 minutes in 30 laid down by the Bury Council. One observation showed $28\frac{1}{2}$ minutes black smoke and $1\frac{1}{2}$ of moderate smoke in 30 minutes!

East Ham.

Dr. W. Benton reports that an up-to-date steam disinfecting station is needed. An agreement has been made with West Ham Corporation for dealing with small-pox cases.

Judging from Dr. Benton's report as school medical officer, the East Ham Education Committee do not take their duties very seriously. Only children whose acuteness of vision is $\frac{6}{18}$ or less are offered the chance of treatment at the school ophthalmic clinic.

The two rooms occupied by the dental clinic were built as store-rooms and are totally unfit for the practice of dentistry. The system of charging has interfered with the attendance and retarded the work. The appointment of at least one more dental surgeon is urged. The dental needs of children over 10 years cannot be systematically dealt with. The school dentist, Mr. Cyril S. Neame, who also treats cases sent by the maternity and child welfare centres, comments on the wonderful improvement in the health of the mothers treated (although to his regret he has not the facilities to provide dentures), and mentions that it is no uncommon thing for him to treat babies of 19 months who have septic mouths and require three or four extractions. The results of past years' work are becoming evident in the lessened amount of oral sepsis among the scholars.

Dr. Benton emphasises the need from the preventive point of view for proper provision being made for the large number of delicate and pre-tuberculous children in day and residential open-air schools and schools of recovery. From the lack of a cleansing and disinfecting centre for the treatment of uncleanliness, scabies, and other skin diseases the education of many children is interfered with. During 1922, 12,145 school sessions were lost by children suffering from such conditions, as compared with 10,113 in 1921.

There are no special centres available for the education of physically or mentally defective children unable to attend ordinary public elementary schools. A remedial clinic, with massage, &c., is needed for cases of infantile paralysis, spinal curvature, &c. Dr. Benton points out that the scheme in operation for securing payment from parents for the cost of treatment has resulted in a setback to the work of following up, and that the school nurses are likely to become unwelcome officials rather than friendly advisers. The primary consideration, he urges, should be to secure treatment, and the financial question should form no part of the duties of members of the school medical service.

Derby.

Dr. Albert E. Brindley tells us that 1922 was a "measles" year. There were 2618 cases notified, with only 12 deaths, and this lower mortality as compared with past measles years he claims as being in no small measure due to the educational efforts of the health staff. The figures for 1922 show that the death-rate among hand-fed babies was nearly four times that of those naturally fed. Dr. Marion Knowles, maternity and child welfare medical officer, says the work of the dental clinic grows slowly, but that the old idea that nothing can be done for the teeth during pregnancy dies hard. She is anxious that the clinic should provide dentures for the mothers in necessitous cases. Dr. W. H. Wray, tuberculosis officer, states that an endeavour is being made to limit admissions to the sanatorium to early cases and to increase the length of stay. The average stay per patient was increased from 90 days in 1920 to 196 days in 1922. Nine shelters are on loan for continuing sanatorium treatment at home, and Dr. Wray thinks this method might be usefully extended. Two cases of anthrax of the localised type occurred during the year. In each case the patient worked at a tannery and was treated successfully by operation at the Derbyshire Royal Infirmary. The source of origin was said to be imported goat skins.

Bournemouth.

Dr. A. D. Edwards thinks the Registrar-General has considerably under-estimated the population. He therefore gives some of the principal statistics obtained on his own estimate of 93,770 and on the Registrar-General's of 81,500 side by side. For purposes of comparison between the various towns the only equitable method is, obviously, to accept the Registrar-General's estimates. Perhaps, too, it is better for a health resort to be stimulated by an over-estimated death-rate than lulled to sleep by an under-estimated one. The Corporation housing scheme consists of 164 houses, 162 built by contract and two presented to the town by the Builders' Guild. Each house contains at least three bedrooms, a parlour, and bathroom. The weekly rents, inclusive, except for water-rate, are as follows :—

Ministry type.				Number.
B.	3-bedroomed	semi-detached ..	12s. 6d.	88
B4.	4- ,,	,, ,, ..	14s. 0d.	6
B.	3- ,,	in block of 4 ..	12s. 6d.	60
B4.	4- ,,	detached.. ..	15s. 6d.	4
B.	3- ,,	,, ...	14s. 0d.	6

The applicants were divided into Bournemouth ex-Service men married with families, married without families, and single ; and Bournemouth non-ex-Service men and non-Bournemouth ex-Service-men similarly subdivided. Nearly all the tenancies were allotted to Bournemouth ex-Service men with families. Four of the four-bedroomed houses have been adapted, so that each may accommodate two families, each co-tenant being responsible to the Corporation for half of the rent. On written application the committee may grant permission to sub-let, provided the sub-tenancy includes a sitting-room, a bedroom with fireplace, and joint use of scullery fittings, bathroom, and water-closet. The sub-tenant is liable for not more than half of the rent and water-rate, which he pays to the tenant. On Dec. 31st, 1922, there were 37 sub-tenancies recorded in the register. The committee may grant permission to keep poultry. The number is limited to eight fowls, and the height of the hen-house to 5 ft. On Dec. 31st, 1922, there were 75 poultry runs. The erection of 18 sheds for cycles, &c., has been permitted up to the present.

The public analyst, Mr. R. A. Cripps, reports that four of 21 samples of cream illegally contained a boron preservative, and that samples of sponge cake contained boric acid up to 31½ gr. per lb. The boric acid in the latter case is used to preserve the liquid eggs used for making the sponge cake. Of 21 samples of green peas 16 contained copper, in four instances undeclared. It is customary in Bournemouth not to take proceedings if the presence of copper is declared on the label and the quantity does not exceed 2·0 gr. of sulphate of copper to the lb. of peas. Penalties of £2 and £1 11*s.* 6*d.* costs were obtained in respect of five samples, the highest amount of copper sulphate present being 4·1 gr. to the lb. In a sample of lime-juice cordial about half the acidity was due to adulteration with phosphoric acid. Mr. Cripps comments on a successful defence of this practice in London, when it was claimed to be an improvement. He is still of opinion that this practice is a gross fraud, and suggests that if it is permissible to replace the natural constituents of a foodstuff by cheaper substitutes under the specious plea of "improving," the manufacturer might advertise the "improvement" on the label and there would then be no prejudice to the purchaser, especially if the price charged corresponded with the reduced cost to the maker.

SCHOOL MEDICAL SERVICE.

Derbyshire.

DURING the year 26,744 children were medically examined, 26,389 of these coming under the routine age-groups. Of the latter 6702 were referred for treatment, and during the year 2505 children received treatment for eye trouble, 3605 for ear disease. Operations for diseased tonsils and adenoids were performed upon 1155 children, and these are excluded from school for two weeks after operation ; 151 cases of ringworm were treated by means of X rays.

Dr. Sidney Barwise demonstrates that the boys and girls in Derbyshire are taller and heavier than the average of the same class in England and Wales, but in the later ages the advantage is not maintained. Examination of the secondary school-children reveals the fact that postural deformities, with the exception of flat-foot, are much less common in boys than in girls. Of 816 boys examined, 54 had more or less flat-foot ; 2 per cent. had colour blindness. Of 1803 girls examined in the secondary schools 270 had enlarged or septic tonsils and adenoids. Goitre was present in 194. In the more marked cases it was fairly easy to persuade the parents to have the condition treated, but in far too many of the milder cases it is still regarded as just Derbyshire neck—something that runs in the family. Tables are given showing the personal equation of the doctor in discovering and recording defects, the percentage of children referred for all conditions varying in different doctors' districts from 33·6 to 11·5 per cent. During the year 861 children were excluded from school : 105 because they were verminous, 755 for medical reasons, 287 of these being on account of tuberculosis. There were 17 permanent exclusions from school, 7 of them being on account of mental condition, 2 for epilepsy, and 2 for defective vision.

Dr. Mary Gallagher gives the results of 983 cases of enlarged tonsils and adenoids upon which she had operated. In one-half of these cases the condition had caused secondary complications, such as suppurating middle-ear disease or chronic catarrh of the middle ear with deafness, chronic inflammation, and discharge from the nose. In a considerable number of cases operation had to be deferred owing to treatment for anæmia, septic teeth, &c., having to be carried out. In one case the child had to be treated for six months before she was fit for operation ; considerable pains have been taken to follow up these cases. Of the 983 cases operated on, 890, or 90 per cent., were discharged cured and 83 improved. In 10 cases there was no improvement. In several cases operations were performed on children who had already been operated on with the guillotine—that is, a piece of the tonsil had been sliced off, and after a short time the symptoms had unfortunately recurred. The cardiac condition of 30 children was such that the operation was performed without an anæsthetic.

The school dentist submits an interesting report. He finds that out of the number of children inspected 80 per cent. were referred for treatment and 20 per cent. actually treated. He insists that any propaganda for the prevention of caries in children must depend on the teachers. Dental extractions amounting to 19,936 and 13,526 dental fillings were accomplished. This is a considerable increase on the figures for previous years; more than twice the number for 1920 and three times that for 1918. The extra work was accomplished at a comparatively small increase of expenditure by the use of dental dressers. It would be interesting to compare the cost per head for 1922 and 1918. The employment of dressers for the unskilled work is found to reduce working costs considerably, with no loss of efficiency. Sanction has been granted by the Board of Education for the continuance of this experimental scheme for a further two years, by which time, it is hoped, it will have thoroughly vindicated itself.

Derbyshire Education Committee are certainly to be congratulated on the consistent way in which they have tackled the problem of treatment of defects found among the rising generation. As long ago as 1909 they started a scheme for dental treatment. They were also pioneers in the introduction of X ray treatment for ringworm, which has made such a difference in school attendance statistics all over the country. They have established a specialist service conspicuous by its conscientious work. The medical and nursing staff here have had to be reduced in the interests of economy, but it is to be hoped that the economy campaign will not deal too ruthlessly with a scheme of treatment built up with so much care and foresight.

STORY OF THE SMALL-POX EPIDEMIC IN GLOUCESTER.

AT a special meeting of the Health Committee of the City of Gloucester held on Sept. 7th, a report on the circumstances of the recent small-pox epidemic in that city was read. This report was approved and adopted by the committee with only one dissentient. The following extracts from the report outline the main facts attendant on the outbreak of the disease and on the administration of the powers of the local authority in dealing with it. The extracts embody suggestions for the better working of the Public Health Services, arising from conclusions arrived at by the acting medical officers of health and approved by the Health Committee. The report states:—

Prior to the month of June, in March and April, only six cases of small-pox in the city had been *notified, registered,* and *reported as such to the Ministry of Health.* These cases were all sent to the small-pox hospital at Longford and were in due course discharged; and at a meeting of the council on May 30th the chairman of the Health Committee (Councillor Wood), relying on the report of the medical officer of health, stated that the city was then quite free from small-pox.

Cases Diagnosed as Chicken-pox.

On June 1st Dr. J. R. Hutchinson, a medical officer of the Ministry of Health, came to Gloucester and late in the evening had a conference with the Mayor (Councillor J. O. Roberts), the chairman of the Health Committee, Alderman Dr. Knight, and the medical officer of health (Dr. Bibby), and stated that he had been sent to Gloucester by the Ministry to inquire as to the existence of small-pox in the city, having regard to the fact that although cases were notified in surrounding districts, some of which were believed to have become infected from Gloucester, no cases were being notified from Gloucester, that he had visited a number of cases which had been notified as chicken-pox and found them to be small-pox, and that he had found other cases of small-pox which had not been notified in any way. As it appeared that the medical officer of health questioned Dr. Hutchinson's diagnosis, it was agreed that Dr. Hutchinson should arrange for an expert to come to Gloucester and report upon some of the cases. In the evening of the following day (June 2nd) Dr. Hutchinson returned to Gloucester with Dr. A. F. Cameron (medical superintendent of the rivers hospitals and ambulance services of the Metropolitan Asylums Board) and had a conference with the Mayor, the chairman of the Health Committee, and the town clerk, when Dr. Hutchinson reported that since their arrival they had seen the medical officer of health and examined about 16 patients, Dr. Cameron agreeing with Dr. Hutchinson that, with the exception of one case of chicken-pox, all the patients examined were suffering from small-pox. Dr. Hutchinson intimated that the course to be adopted was fully explained in Memorandum 71a issued by the Ministry in November last (which was laid before the Health Committee when issued, and again in March last), but he also made a number of suggestions for the guidance of the committee.

On June 3rd Dr. Cameron and Dr. Hutchinson had a further interview with the Mayor, when Dr. Cameron stated that he had examined 15 more patients, making 31 in all, and that, with one exception, they were all suffering from small-pox.

A special subcommittee was formed to consider any question arising in connexion with the outbreak of small-pox with power to deal with any matters of urgency.

Appointment of Dr. W. H. Davison.

At a meeting on June 11th of the special subcommittee formed to deal with the outbreak the chairman reported that he had been to Birmingham and, through the kindness of the corporation of Birmingham, had arranged for Dr. W. H. Davison (assistant medical officer of health) to come to Gloucester for a month to assist the medical officer of health in dealing with the outbreak of small-pox. It was then resolved—

> "That Dr. W. H. Davison be requested to deal with all notifications of small-pox and chicken-pox, arrange as to the course to be adopted for investigating, dealing with and following up such cases, and generally dealing with the epidemic; and that he be given plenary powers with regard to such matters, including authority to give directions to the staff of the health department and visit patients in hospital."

At a meeting of the Health Committee on June 15th it was temporarily arranged (subject to the sanction of the Minister of Health) for Dr. Davison to perform any of the duties of a medical officer of health, in connexion with the existing outbreaks of small-pox and chicken-pox in the city and measures for preventing the spread of such diseases; and he was accordingly appointed to perform all or any of such duties with all the powers of a duly appointed medical officer of health. The committee also passed a resolution recommending the council to delegate to them and to the special subcommittee, during the present outbreaks of small-pox and chicken-pox or until further order, authority to exercise any of the powers of the local authority or corporation under the Public Health Acts, 1875 to 1907, the Infectious Disease (Prevention) Act, 1890, and the Gloucester Corporation Acts, 1894 and 1911, with respect to those diseases and measures for preventing the spread thereof; and such recommendation was duly approved and adopted by the council. The hospital at Brockworth was opened for the reception of patients on June 15th.

Difficulties of Public Health Administration.

At a special meeting of the council on June 20th Dr. Davison read a report dealing with the epidemic in which he stated that as the outbreak had been allowed to go unchecked for such a long time, great difficulty was experienced in getting patients to agree to removal to hospital. There were certain influences at work endeavouring to foster this resistance and throw sand on the administrative machinery designed to protect the community. An emergency meeting of the Health Committee was held on June 23rd. Dr. Davison stated that the present conditions made it impossible for him to continue to take administrative charge of the epidemic, and referring to the fact that he had pointed out that it was a ridiculous position to have in charge of small-pox cases a medical superintendent who did not admit the cases to be small-pox.

Resignation of Dr. J. R. Bibby.

At a special meeting of the Health Committee on June 25th the chairman referred to the fact that at the last meeting it was explained that the subcommittee had suggested to the medical officer of health that, having regard to his views about the epidemic, he should temporarily relinquish all duties in connexion therewith and that he had refused to do so. After hearing the report of members of the committee who had since seen the medical officer of health, it was resolved—

> That it be recommended that, as far as practicable, and until further order, the medical officer of health (Dr. Bibby) be relieved from all duties connected with the diagnosis of cases of small-pox and chicken-pox and the admission to hospital of cases of small-pox and their subsequent treatment and discharge; and also from the superintendence, administration, and visiting of the hospitals at Longford and Brockworth.

At the same meeting Dr. Davison stated that it would be necessary to obtain additional medical assistance, and it was decided to apply to the Metropolitan Asylums Board for two suitable men. This resulted in Dr. R. W. Jameson and Dr. G. R. Painton coming to Gloucester on June 27th, when it was arranged that Dr. Jameson should take charge of the hospital at Brockworth, and that both should assist Dr. Davison generally in dealing with the epidemic. At a meeting of the special subcommittee on June 29th Dr. Davison advised that Dr. Jameson and Dr. Painton should be authorised to exercise the powers of a medical officer of health, and a resolution recommending that course was passed, and in due course approved by the council and the Minister of Health.

Dr. Bibby sent in his resignation as medical officer of health for the City and the Gloucester Division of the Customs Port of Gloucester, which was accepted.

At a meeting of the Health Committee on July 6th Dr. Davison reported that at 9 o'clock that morning there were 230 patients at the Brockworth Hospital. In connexion with the medical assistance which the committee have had in dealing with the epidemic, it should be mentioned that Dr. C. Killick Millard, medical officer of health of Leicester, had intended to take a holiday in Switzerland, but in order to assist Dr. Davison very kindly spent three weeks of his holiday at Gloucester, without any remuneration beyond hotel expenses and railway fares—a service which has been much appreciated.

Incidence and Treatment of Small-pox in the City.

As many cases of small-pox had been wrongly diagnosed as chicken-pox instead of small-pox, and therefore had not been isolated, it was found when Dr. Davison came that there were a number of cases of small-pox in the city and it was necessary to deal with such cases and their contacts. This was done in a very thorough manner, and contacts were kept under surveillance and offered vaccination. The largest number of patients in the hospital at any one time was 254, the total number admitted up to date being 507; but all have now been discharged, except 13, and it is hoped the epidemic is practically over. The admissions for the week ended noon, Sept. 4th, were two, in different houses, both contacts who had developed the disease.

Mild Type of Small-pox.

The epidemic is referred to as "mild" small-pox as some 70 per cent. of the cases have been very mild, 25 per cent. moderately severe, and 5 per cent. severe, with only three deaths, only one of which was caused by uncomplicated small-pox, and this an infant 6 weeks old, small-pox being a contributory factor in another death, and not even a contributory factor in the third death, though the patient had a mild attack. Owing to the mildness of most of the cases, some persons appear to have mistaken them for chicken-pox, but the subcommittee were advised that they were certainly small-pox, and that is not only the opinion of the experts engaged by the council and most of the medical men in the city, but that diagnosis has been confirmed by many medical officers of health and other medical men who have visited the hospital. As showing that the disease is quite distinct from chicken-pox, the subcommittee are informed that it has been found that the one disease is not a protection against the other, and that, while vaccination is a protection against small-pox, a person suffering from the disease cannot be successfully vaccinated.

This mild type of small-pox is stated not to be new. A circular letter was recently issued by the medical officer of health and assistant medical officer of health of Bristol to medical practitioners of that city stating that they had had an opportunity of seeing cases of the present outbreak in the Gloucester Hospital and found that they *resembled in every particular* the mild cases which were being constantly introduced in Bristol in 1903–4, and as constantly stopped from spreading by the loyal coöperation of the medical profession, and pointing out the urgent importance that it should not be mistaken for chicken-pox.

As far as is known to Drs. Painton and Jameson, the Gloucester epidemic appears to be strictly comparable and indeed identical with what has been going on in Yorkshire, Derbyshire, and the Midlands during the last two years, and something of the same kind appears to have been met with in America where, in order to distinguish it from the more virulent type, it is sometimes called alastrim. The consensus of medical opinion and the evidence seem to show that the disease is undoubtedly small-pox and quite distinct from chicken-pox, though the patients have not suffered from some of the more severe symptoms met with during the epidemic of 1896. As showing that a mild case may cause a much more severe one, reference may be made to cases which occurred in one family in June last. A girl, aged 12, had an exceedingly mild attack. She gave it to a brother aged 14, who was one of the worst cases dealt with. It is very important, the report states, that cases of small-pox should be promptly and carefully isolated; but apart from any question of wrong diagnosis, it would appear that, as in 1896, there have been cases of concealment.

History of a Typical Case.

C. N. S. was admitted as a patient at the small-pox hospital on August 30th. From the report of Dr. Painton it appears that on August 25th the patient, who had been at home unwell since the previous Thursday, sent for a doctor, and was seen by Dr. L., who thought he was suffering from influenza. On the following Thursday, August 30th, as the patient had not been to work for a week, his employer requested a doctor to find out why he had not come to work, and as a result Dr. L. again saw C. N. S., and reported at the health office that he was suffering from what he considered to be an attack of small-pox and asked that Dr. Painton should see the case. Drs. Painton and Jameson visited the case the same day and found it to be undoubtedly one of small-pox and the patient was willingly removed to the small-pox hospital. The patient has since been seen by a number of local medical men and also by two experts who all agreed that the patient was suffering from small-pox, one of the experts certifying that "the illness and present condition are typical of the disease," and the other that "the symptoms and features of his illness are quite characteristic."

The prodromal history of the case is described in the following statement made and signed by the patient on Sept. 1st:—

> I was first ill on Thursday morning, feeling dicky, headache, pains in my legs and as if I had an influenza cold coming on. I laid down till dinner-time and then sat about. Feeling a bit better on Friday morning I stayed in house and garden on Friday. On Friday afternoon I felt a lowering pain in my lower back across from one side to the other. On Saturday morning, after the night's rest, I felt a bit better. Later in the day about dinner time I felt I was going to be bad and sent for Dr. C. Dr. L. came. I was in bed when he came. I felt queer. I felt hot over my body, just as if a cold was coming on from Friday morning on till Monday. I ate my dinner on Sunday, but did not enjoy it. On the Thursday the pain in my legs was very bad. I felt better on Monday and went to Court. On the Tuesday morning, when I got up at 8 o'clock, I noticed spots on my arms. The rest of the rash came out on the same day, Tuesday, just as it is to-day. No rash came out on the Wednesday. Dr. H. saw me on Sunday, Monday, and Tuesday, and he called again on Wednesday night to count the spots on my little girl's hand, and he looked at my hands and face again then.

The local authority and those helping them have had to contend with great difficulty and obstruction in dealing with the epidemic, and it is pointed out that the public must realise that unless steps are promptly taken to correctly diagnose doubtful cases and to notify cases which ought to be notified, they will always be liable to epidemics and the trouble and expense resulting therefrom.

The Reporting of Notifications by the M.O.H. to the Ministry of Health.

When a notification is sent in it is to be assumed that the case is one for investigation and the notification should be acted upon unless, as a result of consultation with the medical officer of health, or otherwise, the person making the notification should feel justified in withdrawing or revising it; but if a medical officer of health should not agree as to the correctness of the diagnosis of a case as notified by a medical practitioner, the proper course would appear to be for the medical officer of health to report the notification to the Ministry of Health with his own view of the case in order that any doubt as to the diagnosis may be promptly decided. If that course had been adopted in Gloucester, any question of diagnosis might have been dealt with in January, at which time recent inquiries show that the disease existed, instead of June, all the early cases might have been promptly isolated in the hospital at Longford, and, in all probability, the anxiety and great expense involved in connexion with the hospital at Brockworth and the isolation and treatment of a large number of cases therein might have been avoided, as well as the indirect but far greater loss to traders and others resulting from the adoption of a wrong course and the wide publicity given to the matter in the public press.

The general facts with regard to the epidemic are shortly summarised in this report; but much valuable information is contained in reports made from time to time to the subcommittee by Drs. Davison, Painton, and Jameson, and particularly in the following: (1) Report by Dr. Painton on the epidemic viewed from the administrative point of view; and (2) report by Dr. Jameson on the hospital aspect of the epidemic.[1] While referring to such reports the subcommittee desire to place on record their great appreciation of the very valuable assistance rendered by Drs. Davison, Painton, and Jameson, and of the able manner in which the epidemic was dealt with by them when called in, although it had been allowed to get widely distributed through the city.

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[1] Copies of the Reports of Drs. Painton and Jameson are being printed with reproductions of the photographs, maps, and charts, and a limited number of copies may be obtained from Messrs. L. A. Smart and Sons, Northgate-street, Gloucester. Price 10*s.* 6*d.*

Questions Raised by the Epidemic.

In conclusion, the report makes the following statements :—

The facts connected with the epidemic raise questions of great importance which seem to require careful investigation, and it would appear desirable that the Ministry of Health should consider the circumstances leading up to and connected with or incident to the epidemic, and also consider the following and other incidental matters :—

1. The adequacy of the provisions of the Infectious Disease (Notification) Act, 1889, and the need for amending the same or amending or more clearly defining the duties of medical officers of health, so as to make sure that cases notified shall be investigated and properly dealt with.

2. The need for adequate facilities for ascertaining whether any inmate of a dwelling-house is suffering from an infectious disease. This appears necessary as the admission of the acting medical officer of health was for a time refused ; and, although there is power of entry for a variety of purposes, there does not appear to be any for a case of this sort.

3. Having regard to the fact that this mild type of small-pox is *very infectious*, though some persons appear uncertain about the diagnosis, it appears necessary for the protection of the country generally that prompt and reliable measures should be taken to find and deal with cases which may occur ; and as prompt isolation of cases is essential for the protection of the country at large, it is submitted that this should be enforced by the Ministry, and that the cost, or a large part of it, should be contributed out of Government funds.

THE DENTAL STUDENT.

A GUIDE TO TEACHING INSTITUTIONS IN DENTISTRY.

THE Students' Number of THE LANCET, which appeared on August 25th, contained information likely to be of use to those who propose to take up dental surgery as their career in life. An account was there given of the functions of the Dental Board, of the conditions for registration as a dental student, and of the examining bodies in dentistry. Of teaching institutions those connected with the several universities were described in some detail, but in addition to these there are a number of institutions which offer facilities to dental students and which are now set out under their localities.

LONDON.

Royal Dental Hospital of London, School of Dental Surgery, Leicester-square.—A school of the University of London, and women are now admitted as students and are eligible for all hospital appointments and school prizes. The school provides the special dental education required by the Royal College of Surgeons for the Licence in Dental Surgery. The general part of the curriculum may be taken at any general hospital. The hospital is open from 9 A.M. to 5 P.M., there being one staff for the morning and another for the afternoon of each day. Pupils are received for the training in dental mechanics recognised by the curriculum. The instructors at the commencement of each session give a course of lectures on Operative Dental Surgery. The five house surgeoncies are held for six months each and are open to all qualified students. The lecturers, in addition to their lectures, give special demonstrations on the Microscopy of Dental Anatomy and Dental Surgery. The lecturer on Dental Mechanics also gives practical demonstrations in the laboratory. There is an Entrance Scholarship in Chemistry and Physics of the value of £50. One Entrance Scholarship in Dental Mechanics and Metallurgy, value £25, open to pupils of the Hospital only. One Entrance Scholarship of £25 in Dental Mechanics, open to pupils of private practitioners. The Saunders Scholarship of £20 and Saunders Prize of £5 awarded to second year students. The Storer Bennett Research Scholarship for Scientific Research in any branch of Dental Surgery, value £50, is awarded triennially. The Alfred Woodhouse Scholarship of £35 and the Robert Woodhouse Prize of £10 for Practical Dental Surgery. Prizes and certificates are awarded by the lecturers for the best examinations in the subjects of their respective courses at the end of the summer and winter sessions. Fee for two years' hospital practice required by the curriculum, including lectures, £70 in one payment, or £73 10*s*. in two yearly instalments. The curriculum requires two years to be passed at a General Hospital ; the fee for this is about £68 5*s*. Both hospitals can be attended simultaneously. For the lectures in Chemistry and Physics for the Preliminary Science Examination £13 13*s*. The fee for the instruction in Dental Mechanics and the two years' hospital practice required by the curriculum is £200 if paid in one instalment, or 200 guineas if paid in three equal instalments. The fee for tuition in Dental Mechanics is £70 per annum ; for one year's hospital practice £28. The Winter Session opens on Oct. 1st.

University College Hospital Dental School, corner of Great Portland and Devonshire-streets, W.—This Hospital and School has recently been thoroughly reorganised, and is now fully equipped with all the most modern appliances. Students are entered as students of University College Hospital, and, as such, attend the classes of Chemistry, Physics, Anatomy, and Physiology in University College, which is a few minutes' walk from the Dental Department in Great Portland-street, hitherto known as the National Dental Hospital, the first Dental School to admit Women Students. Practical courses to comply with the R.C.S. curriculum are held. Clinical Lectures and Demonstrations are given, and each student on entering passes through a preliminary course under a demonstrator. Composition Fees : Comprising two years' Dental Mechanics, Anatomy, Physiology ; two years' Hospital Practice, Medicine, Surgery, and Dental Lectures (four years) : 1st year, £56 ; 2nd year, £84 ; 3rd year, £64 ; 4th year, £32. Total, £236. Medical Men : Two years' Mechanics, and Dental Practice and Lectures : 1st year, £102 6*s*. ; 2nd year, £70. Total, £172 6*s*. For a six years' course of medical and dental education comprising the whole of the dental curriculum and the curriculum for the M.R.C.S., L.R.C.P. diplomas : 1st year, £91 ; 2nd year, £70 ; 3rd year, £73 ; 4th year, £60 ; 5th year, £73 ; 6th year, £49 ; total, £416, in six instalments payable in advance.

Guy's Hospital.—The work of the Dental Department begins daily at 9 A.M. both in the extraction rooms and in the conservation room. The Extraction Rooms : There is ample accommodation for ordinary extractions and anæsthetic extractions, together with waiting- and retiring-rooms. Patients are admitted between 8.45 and 9.30 A.M., and are seen by the dental surgeon for the day, the staff demonstrator, the dental house surgeon, and the dressers. The Conservation Room is open from 9 A.M. till 5 P.M. It has a floor space of over 6000 square feet, and affords accommodation for about 100 dental chairs. with the necessary equipment of the most modern type, for the use of the Dressers, who, under the supervision of the Staff, perform the various operations of Dental Surgery. The members of the staff attend every morning and afternoon to give demonstrations and otherwise assist students in their work in the Conservation Room and Prosthetic Laboratory. The Probationers' Laboratory is supervised by three of the staff demonstrators, and instruction is given in operative dentistry on a " mannikin " to students during their first three months of clinical study. Students in Dental Prosthetics are received, and a graded. systematic, and full course of instruction, extending over two years, is carried out under the supervision of the Director of the Prosthetic Laboratory, assisted by two demonstrators and five mechanics. Dental students have the opportunity of attending at this hospital the whole course of instruction required by the examining board for the B.D.S. Lond. or L.D.S. Eng.—viz., the complete course in dental prosthetics, the special lectures and practice of the Dental Department, and the general lectures and practice of the Medical School. The fees for these two courses may be paid separately or together, or they may be combined with the fees required to be paid for the course for a medical diploma. Students who enter for a medical as well as a dental diploma are allowed to pursue their study of Dentistry during any period of their medical course most convenient to themselves without further charge. Two Entrance Scholarships are awarded in September, a War Memorial Scholarship in Arts of the annual value of £40 for four years; and a Science Scholarship of the value of £40 per annum for not more than four years. Prizes of the aggregate value of £40 are awarded for general proficiency and for skill in Operative Dentistry. The Newland-Pedley Gold Medal for Operative Dentistry is also awarded annually. Dental students are eligible for admission to the Residential College and enjoy the privileges of students in the Medical School. Application should be made to the Dean of the Medical School.

London Hospital.—This school is a part of the London Hospital and Medical College, and is fully equipped on the most modern lines and with the latest appliances. It provides a complete curriculum in all subjects for the B.D.S. Degree and for the L.D.S. Diploma, and is admirably adapted for the purpose of teaching. The Conservation Room is well lighted and ventilated and fitted with pump chairs of the latest pattern; the fountain spittoons at many of the chairs have been specially designed. Each spittoon has attached to it a saliva ejector, hot and cold water, compressed air, gas and electric current, also a swing bracket to carry the students' cabinet. Electric sterilisers are supplied in each department and motor engines where required. The School possesses in addition to the Theatres, Laboratories and Museums in the College, a special Museum of Dental Anatomy and Surgery, Operative Dentistry, Prosthetic and Extraction Rooms, and Laboratories for Practical Dental Metallurgy and Dental Prosthesis. A systematic course of instruction in Dental Prosthesis is arranged for pupils. The up-to-date Laboratory contains every modern apparatus and is in charge of a skilled curator and his assistants. Connected with the Medical College and Dental School are a Library, Athenæum, Clubs' Union, Dining Hall with moderate tariff, Students' Hostel, and an Athletic Ground. For full particulars as to fees and course of study advised apply to the Dean, Prof. William Wright, who will be glad to make arrangements for anyone wishing to see the Dental School and Medical College.

London (Royal Free Hospital) School of Medicine for Women.—Full courses are arranged for women students, in conjunction with the Royal Dental Hospital, Leicester-square, for the study of dentistry, and in preparation for the B.D.S. Degree of the University of London and the Licence in Dental Surgery of the Royal College of Surgeons of England, at the London (Royal Free Hospital) School of Medicine for Women.

PROVINCIAL.

Birmingham Dental Hospital, Great Charles-street.—Dean: Mr. W. T. Madin. The Dental Hospital was founded in 1858, and was recognised by the Royal College of Surgeons in 1880 for the teaching of Dental Students. Having an annual attendance of about 21,000 patients, it affords every advantage for students about to enter the profession to acquire a thorough practical knowledge, as required by the Medical Council. The present Hospital was opened on July 6th, 1905. It has accommodation for 50 students. The equipment is in accordance with the most modern requirements for the efficient teaching and practice of Dental Surgery. The operations performed annually average 41,000, including 9000 gold and other fillings, and many cases of crowns, bridges, porcelain inlays, and regulations. By arrangements with the Birmingham University and with the General and Queen's Hospitals the entire course of Lectures, Hospital Practice, &c., may be completed for an inclusive fee of £144 4*s.* 6*d.*, or including Mechanical Pupilage, £255 15*s.* 9*d.*, inclusive of Examination fees for L.D.S. Birm. The instruments and materials necessary for Hospital Practice cost about £45. The Composition Fee for the courses required for the L.D.S. of the University, or any of the Corporations alone, is £75, payable in two annual instalments at the commencement of the first and second years; that for the courses required for the L.D.S. and the Degree in Dentistry of the University is £93 15*s.*; that for the L.D.S. in combination with the M.R.C.S. and L.R.C.P. is £115; and that for the M.B., Ch.B., and B.D.S. is £120. All of these composition fees are payable in two annual instalments at the commencement of the first and second years. Each of these fees covers the cost of the courses given at the University for the qualifications indicated, but does not include fees for Hospital teaching, nor Pre-Dental year Chemistry and Physics. For two years' dental hospital practice the fee is £26 5*s.*, payable in two instalments of £13 2*s.* 6*d.* each at the commencement of the first and second (hospital) years respectively. For two years' mechanical pupilage, £111 11*s.* 3*d.*, which may be paid in two annual instalments of £65 12*s.* 6*d.* and £45 18*s.* 9*d.* respectively; mechanical pupils may join for a probationary period of one month, fee £6 11*s.* 3*d.*, which is deducted upon payment of the full amount. For general surgical hospital practice, lectures, and demonstrations: Surgery, two winters, £13 2*s.* 6*d.* One Entrance Scholarship is offered annually of the value of £37 10*s.* It is awarded to the student who, entering for the Dental Degree of the University in October, or having entered not earlier than the previous April, shall pass the best examination in the subjects studied during his apprenticeship. Candidates must be under the age of 21 years. Application for admission, together with a certificate of birth, must be sent to the Dean of the Medical Faculty, Mr. William F. Haslam, on or before Oct. 15th.

Leeds University School of Dentistry.—The School of Dentistry is adequately equipped to provide for the complete training of the dental student. The School forms a part of the Leeds School of Medicine, whilst the instruction in clinical and mechanical dentistry is carried out in the Dental Hospital at the General Infirmary. The courses of study are mainly designed to meet the requirements of the B.Ch.D. and L.D.S. Leeds, but every opportunity is afforded to students preparing for the degrees or diplomas of other licensing bodies. Full-time demonstrators give the instruction in clinical dental surgery and prosthetic dentistry, which is carried out under the supervision and direction of members of the Honorary Staff, two of whom are in attendance each day. Special facilities are provided for instruction in Orthodontia and Dental Radiography. Prizes are offered for competition to pupils and students in their respective years of study. Communications should be addressed to the Warden, School of Dentistry, The University, Leeds, from whom a prospectus may be obtained.

Dental Hospital of Manchester.—This hospital is in association for teaching purposes with the University of Manchester and the Royal Infirmary, and is in the centre of a very large population. Courses of study are provided to meet the requirements of the various examining bodies, including those of the University of Manchester for the qualifications L.D.S. and B.D.S., and the L.D.S. of the Royal College of Surgeons of England. Clinical instruction is given in Dental Prosthetics, Operative Dentistry, Diagnosis and Extraction, Orthodontics, Dental Surgery, Radiography, and Anæsthetics by specially appointed Clinical Teachers.

For the whole course of hospital instruction for the L.D.S. (including two years' mechanical training) the fee is £131 5*s*., paid in instalments. For the two years' Operative Course only, £26 5*s*., paid in two instalments. For the whole course of hospital instruction for the B.D.S. degree (including mechanical training), £168, paid in instalments. Additional practice in Dental Mechanics may be taken by pupils who have already received their mechanical training elsewhere, at a fee of £36 15*s*. for six months. All the courses of instruction are open to women students. Copies of the Prospectus will be forwarded on application to Mr. J. Hilditch Mathews, Dean.

Newcastle-upon-Tyne Dental Hospital and School.—This hospital is centrally situated (within five minutes of the various colleges, infirmary, and railway station); the rooms are well lighted and thoroughly equipped for carrying on the work. Dental surgeons and an anæsthetist attend each morning. A tutorial dental surgeon and a prosthetic tutor is also in attendance. The Composition Fee for the special Dental Lectures and Dental Hospital Practice is £60 4*s*. if paid in one sum, or £62 6*s*. if paid in two instalments of £31 3*s*. The Composition Fee for the Lectures at the Colleges of Medicine and Science is £57 10*s*.; in addition to this there is a library and an athletic fee. The fee for General Hospital Practice at the Royal Victoria Infirmary, Newcastle-upon-Tyne, is £23 2*s*. Medals and Certificates of Merit are granted to students showing certain standards of proficiency in the various classes at the Dental School. The prospectus of the Dental Hospital and School, containing full information, may be obtained from either Mr. J. T. Jameson, 12, Windsor-crescent, Newcastle-upon-Tyne, Dean, or Mr. James Coltman, 13, Ellison-place, Newcastle-upon-Tyne, Vice-Dean.

Devon and Exeter Dental Hospital, 24, Southernhay West, Exeter.—Established 1880.—The hospital is open on Mondays, Tuesdays, Wednesdays, Thursdays, Fridays, and Saturdays, and patients are admitted between the hours of 9.30 and 11 A.M. Students attend the practice of the hospital under the control of the medical officers. Honorary treasurer, Mr. J. M. Ackland; secretary, Mr. Albert G. Littlejohn.

SCOTLAND.

The Incorporated Edinburgh Dental Hospital and School.—The Edinburgh Dental Hospital and School is located in spacious and well-equipped buildings at 30, 31, and 32, Chambers-street, and offers special advantages to dental students. The General Courses required for the Dental Diploma may be taken in the Medical School of the Royal Colleges of Physicians and Surgeons or in the University schools. The general hospital attendance and clinical instruction are taken at the Royal Infirmary. The University, Medical Schools, and Royal Infirmary are within three minutes' walk of the Dental Hospital. The special courses are taken in the hospital. The Dental Hospital practice, extending over two years, affords a student ample opportunity for a full acquaintance with every branch of dentistry. The hospital admits a limited number of indentured pupils. They receive their instruction in Mechanical Dentistry concurrently with the general and special courses. A premium of 60 guineas is payable with each such pupil. The practice and lectures of the hospital are recognised by, and qualify for, all the Licensing Boards. The cost of the hospital outfit of instruments is included in the Dental Hospital fee of £42. The minimum cost of classes and Diploma for the whole course of dental instruction amounts to £98 17*s*. Those students who desire to take a Medical and Surgical Diploma in addition to the L.D.S. have in this school admirable facilities for so doing. The triple qualification of the Royal College of Physicians and Surgeons of Edinburgh and the Royal Faculty of Physicians and Surgeons of Glasgow is recommended. The minimum cost of Professional Education, the Triple Qualification, and the Licence n Dental Surgery amounts to £172 19*s*. The Higher Dental Diploma (H.D.D.) of the Royal College of Surgeons affords an opportunity of obtaining a higher qualification subsequent to registration. The Prospectus, with full information, may be obtained by application to the Dean or the Assistant Secretary.

Incorporated Glasgow Dental Hospital, 158, Renfrew-street and 15, Dalhousie-street, Glasgow.—The School is open to Men and Women Students, and Lectures are given on Dental Surgery, Operative Dental Surgery, Orthodontia, Dental Anatomy and Physiology, Pathology, Dental Histology, Dental Mechanics, Crown and Bridge work, Dental Metallurgy, Dental Bacteriology, and Anæsthetics. A new Radiography department has been added. Lectures on general subjects required for Dentistry may be taken at the University or at one of the extramural schools where special provision is made for Dental Students. Composition fee for two years' Hospital Practice and Lectures special to Dentistry, £50 on entry, or in two instalments of £31 10*s*. and £21. A new mechanical laboratory with bench accommodation for 60 pupils and fully equipped with the most modern appliances for teaching practical dental mechanics has recently been added. Fee for two years' tuition, £63, or in two instalments. Full information may be had on application to the Dean.

Glasgow Royal Infirmary (Dental Department).—Mr. W. R. Taylor attends at the Royal Infirmary at 9 A.M. on Wednesdays and other days as arranged. The following course in the curriculum can be taken at St. Mungo's College: Anatomy, six months; Practical Anatomy, nine months; Physiology, six months; Chemistry, six months; Practical Chemistry with Metallurgy, three months; Surgery, six months; Medicine, six months; Materia Medica, three months; Clinical Surgery, six months; Dental Surgery, six months, and attendance for two years on the dental department of the hospital.

IRELAND.

Incorporated Dental Hospital of Ireland, Lincoln-place, Dublin.—All Dental Students who have passed their First Dental Examination in the Royal College of Surgeons in Ireland (or an equivalent examination or examinations) are admissible to the Clinical Instruction of the Hospital. In addition to Clinical Instruction and Special Demonstrations, courses of lectures are given at the hospital on Dental Surgery and Pathology, Mechanical Dentistry, the Administration of Anæsthetics, Orthodontia, Dental Anatomy, and Dental Materia Medica, and instruction in Anæsthetics. Fees: Hospital Practice (each year), £18 18*s*.; Lectures, £5 5*s*. The course in practical Dental Mechanics can be taken in the Hospital Laboratory. Further particulars can be obtained from the Dean.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

K. V. Francis to be Surg. Lt.

ROYAL NAVAL VOLUNTEER RESERVE.

Surg. Sub-Lt. St. G. B. D. Gray (late R.N.V.R., temp.) to be Surg. Lt. on Permanent List.

ROYAL ARMY MEDICAL CORPS.

Maj. J. W. S. Seccombe retires on ret. pay.

The undermentioned Maj.-Gens., late R.A.M.C., are appointed Hon. Surgs. to The King: H. A. Hinge, C.B., C.M.G., D.S.O., vice Maj.-Gen. S. G. Moores, C.B., C.M.G., late R.A.M.C., retd., and C. E. Pollock, C.B., C.B.E., D.S.O., vice Lt.-Gen. Sir T. H. J. C. Goodwin, K.C.B., C.M.G., D.S.O., late R.A.M.C., retd.

ARMY RESERVE OF OFFICERS.

Col. E. H. Condon, late R.A.M.C., having attained the age limit of liability to recall, ceases to belong to the Res. of Off.

TERRITORIAL ARMY.

Maj. A. H. Falkner relinquishes his commn. and retains the rank of Maj.

TERRITORIAL ARMY RESERVE.

The following having attained the age limit are retired: Lt.-Cols. J. C. Renton and Sir S. J. Sharkey (and retain the rank of Lt.-Col.); Majs. J. J. Cox (retains the rank of Maj.), and G. R. Swinhoe (retains the rank of Maj. and is permitted to wear the prescribed uniform); Capt. J. C. McClure (retains the rank of Capt.).

Capts. A. T. Swan and J. C. Stewart relinquish their commns. and retain the rank of Capt.

ROYAL AIR FORCE.

Flight Lt. H. L. Burton is granted a permanent commission.

INDIAN MEDICAL SERVICE.

Capts. E. S. Goss, C. J. Stocker, A. W. Duncan, L. F. Brandenbourg, and E. A. Penny to be Majs.

DEATHS IN THE SERVICES.

Surgeon-Commander Alec Bedingfield Marsh, R.N., surgeon specialist at the Royal Naval Hospital, Haslar, in diseases of the ear, throat, and nose, died at the age of 46 on Sept. 7th. He was the son of the late Mr. Henry Marsh, Paymaster-in-Chief, R.N., graduated in arts at Oxford in 1899, and qualified with the L.R.C.P., L.R.C.S. Edin., and the L.R.F.P.S. Glasg. with honours in 1903. After serving as assistant medical officer at the County Asylum, Winwick, near Warrington, he joined the Royal Navy in 1904. He served with the Prince of Wales in H.M.S. *Hindustan* and with the Duke of York in H.M.S. *Collingwood* at the outbreak of the war, and was afterwards with the Royal Naval Air Wing at Grantham. During 1919 he served in connexion with the evacuation of Russian refugees on the Black Sea, developing lung trouble from which he never completely recovered. He leaves a widow and two young children.

Surgeon-Colonel William Thomas Martin, A.M.S., retired, died at Bournemouth on Sept. 15th in his eighty-second year. He was a graduate of the old Queen's University of Ireland, where he obtained the gold medal in 1859. He received his first commission in the Army in 1863 and served with the Abyssinian expedition of 1867 and was present at the capture of Magdala (mentioned in despatches and medal). He also served with the Burmese expedition of 1885–87 (medal with clasp). Surgeon-Colonel Martin retired in 1896.

Correspondence.

"Audi alteram partem."

OPHTHALMOLOGICAL TRAINING FOR MEDICAL STUDENTS.

To the Editor of THE LANCET.

SIR,—The letter from Dr. Ernest Thomson in your issue of Sept. 1st seems to me to merit attention. The experience which I gained in teaching large numbers of undergraduates for many years has brought me to the opinion that Dr. Thomson is fundamentally right. Every effort should be made to limit the course to those parts of the subject which are of use to physicians and surgeons and practitioners as means of diagnosis. During all the years that I was teaching I endeavoured to give every student facilities for learning how to see the fundus oculi both by the direct and indirect methods, and generally availed myself of the help of a demonstrator to superintend the work in the dark-room.

No student should be allowed to qualify for registration on the Medical Register who cannot explore the fundus. I have known students who have been through an ophthalmic course without ever having had the opportunity of seeing an ophthalmoscope used. Some of them had seen pictures of the fundus in health and disease thrown on a screen by a projection lantern, but had never seen the ophthalmoscope used. Such a course should certainly not be recognised either for graduation or qualification. I also invariably laid special stress on the taking of fields of vision, the analysis of diplopia, the testing of the pupillary reflexes, and the estimation of visual acuteness. In other words, I did my best to make the students acquainted with those parts of ophthalmic study which may be helpful in localisation. In addition to this instruction, I always discussed in considerable detail iritis, corneal ulceration, interstitial keratitis, glaucoma, and cataract. I feel that nothing more should be attempted in the case of undergraduates. It seems to me that the above subjects are the essentially useful, and that the 20 meetings to which the qualifying course was by regulation supposed to extend—my own course always was one of 40 meetings—was too short to take in anything more than the above subjects, and even these could only be dealt with in an elementary fashion.

In Sir George Newman's lately published report there is a paragraph from which the casual reader might infer that the suggestion to teach the undergraduate the use of the ophthalmoscope is a new one, although, in fact, prominence has been given to that subject in almost every elementary course in the United Kingdom for the last 30 or 40 years. Undoubtedly there were, as I have already indicated, and possibly still are, a few courses in which no opportunity was, or is, given to the students to practise with the ophthalmoscope, but that has been for many years the exception. Personally, I think that instruction deficient in this respect should not be considered as qualifying. It is obvious that the consulting ophthalmic surgeon of a large general hospital should be in close contact both with the physicians and surgeons of the hospital. When the consulting ophthalmic surgeon takes his duties seriously such consultations may be of the greatest value; but I have known one large hospital which had a consulting ophthalmic surgeon who never gave a consultation, but always allowed the work to be done by an assistant, and occasionally by a very incompetent one.

In my own life-time that august body, the General Medical Council, has perpetrated at least two jokes: it ordained that physics should be taught in 50 meetings; it ordained that ophthalmology should be taught in 20.—I am, Sir, yours faithfully,

Glasgow, Sept. 17th, 1923. FREELAND FERGUS.

PATHOLOGICAL DEPARTMENTS.

To the Editor of THE LANCET.

SIR,—The leading article on this subject in your issue of Sept. 8th made special reference to the conditions which exist in Leeds. Since the matter has had some publicity, I desire to add to what has already been written in your columns on this subject.

You remark particularly on the fact that the posts of professor of bacteriology and city bacteriologist have been combined here. While admitting that economy has been a considerable factor in connexion with that arrangement, and that it is not in all respects an ideal one, I think it is desirable to state, in justice to those who have been responsible for this arrangement, that economy has not been the only advantage considered. An arrangement such as the existing one enables a university bacteriological laboratory to carry a considerably larger staff than would otherwise be possible, and amongst these the work is shared out. As a result the public health work of the city is carried out by a group of men who spend their time partly in teaching, partly in research, and partly on routine examinations, instead of being done by one or at most two men, who tend to be deluged with routine examinations. Where the appointment is entirely a municipal one, the city bacteriologist being on a fixed salary, there is a tendency to send specimens for examination without stint, and the bacteriologist may be forced to delegate his work unduly or to adopt rather precarious short cuts. On the other system of payments for specimens examined, there is likely to be a more discriminate demand for examinations, and as soon as there is a real and necessary increase in the work required the university is automatically enabled to increase the staff of its bacteriological department. Of course it might be argued that necessary examinations are cut out on the score of economy. This, if it were the case, would, I think, be the strongest objection to the existing system.

The mental outlook in a laboratory where a good deal of teaching and research are going on should be wider and the methods more enterprising than in a laboratory solely or mainly devoted to routine, and to the extent that that is the case the municipal bacteriology should be more thoroughly done in a university laboratory. On the other hand, the weak points in a scheme, such as that existing at Leeds, are as you suggest: (1) That the time of the heads of the university department concerned may be too much absorbed with administrative duties, and (2) that the health of the city is not the first and only professional interest of the city bacteriologist. I believe, however, that the argument for and against an arrangement such as that existing in Leeds are more evenly balanced than you have supposed.

In a letter on the Status of Pathology in the same issue of your journal Dr. C. Powell White suggests, amongst other proposals, that it is desirable that some university should establish a course of training for pathologists of a standard equivalent to that of the honours courses in other branches of science. As far as bacteriology is concerned at Leeds this has been done. A short course diploma in bacteriology has not been arranged as at Manchester; but bacteriology has been made a principal subject for an ordinary or honours B.Sc. in pure science.

I am, Sir, yours faithfully,
James Walter McLeod,
Professor of Bacteriology, University of Leeds.

Sept. 12th, 1923.

WELLCOME BUREAU OF SCIENTIFIC RESEARCH.

A CORRECTION.

To the Editor of The Lancet.

Sir,—I notice that in The Lancet of Sept. 15th you state that I have resigned my post at the above Bureau *to take up other important duties* (the italics are mine). The wording is unfortunate, as it might lead anyone to suppose that my resignation is due to the fact that I have obtained another position and am relinquishing my duties here on that account. Such is not the case, and I would ask you to be good enough to insert this explanation in your next issue. I realise that the words I have italicised may merely be the expression of a pious hope, a hope I devoutly share, but they are certainly liable to misinterpretation. Hence my request.

I am, Sir, yours faithfully,

Sept. 14th, 1923. Andrew Balfour.

LILLIPUTIAN DOSAGE.

To the Editor of The Lancet.

Sir,—In your issue of Sept. 15th (p. 574) appears an annotation on a paper of Prof. Viton, under the heading "Lilliputian Tuberculin Dosage." At the end of the note you add: "Prof. Viton does not say whether he has or has not carried out control tests with a 0·25 per cent. solution of carbolic acid alone." It seems to me that a consideration of the figures given makes it clear that, at any rate with the higher dilutions, the effect can only be due to the carbolic acid.

If we assume Millikan's value of $6{\cdot}06 \times 10^{23}$ for the number of molecules in a gram molecule, and assume (*a*) that the original tuberculin is *pure* active principle; (*b*) that the molecular weight of this active principle is 200 (this is decidedly below the true value), ve have $\frac{6{\cdot}06 \times 10^{23}}{200}$ molecules in 1 g. of the tuberculin. n the dilution given in The Lancet, this is diluted to 0^{27} c.cm. We therefore have $\frac{6{\cdot}06 \times 10^{23}}{200} \times \frac{1}{10^{27}}$ molecules of tuberculin per c.cin. at the dilution given. This is, statistically, only 0·000003 mols. per c.cm.—i.e., approximately every 300,000th c.cm. contains one molecule of active principle.

Any impurity of the original tuberculin, or any value for its molecular weight over 200 makes this dilution even greater.—I am, Sir, yours faithfully,

Manchester, Sept. 17th, 1923. E. N. Allott.

Medical News.

London Hospital Medical College.—A lecture on the Treatment of Diabetes Mellitus with Insulin will be delivered by Dr. Otto F. F. Leyton on Oct. 15th, at 4.15 P.M., in the Anatomical Theatre of the College. The lecture is intended for senior students of the hospital and postgraduates.

Society for the Study of Inebriety.—The tenth Norman Kerr Memorial Lecture on Drug Addiction will be delivered by Sir William Willcox, on Oct. 9th, at 4 P.M., in the Hall of the Medical Society of London, 11, Chandos-street, Cavendish-square, London, W. 1.

Royal Institute of Public Health.—The next Congress will be held in Bordeaux, France, from Wednesday, June 4th, to Monday, the 9th, 1924 (Whitsuntide). The Congress will be under the Presidency of Lord Burnham and will be conducted in the following sections: (*a*) State Medicine and Municipal Hygiene—President, Sir Humphry Rolleston; (*b*) Naval, Military, and Air—President, Surg. Vice-Admiral Joseph Chambers; (*c*) Industrial Hygiene—President, Sir Thomas Oliver; (*d*) Tropical Diseases—President, Sir Ronald Ross, F.R.S.; (*e*) Pathology, Bacteriology, and Biochemistry—President, Sir John Bland-Sutton; (*f*) Women and Public Health—President, Lady Crewe. The meetings will be held in the University of Bordeaux and the Council will be pleased to welcome anyone interested in public health work. Further particulars can be obtained on application to the Secretary, 37, Russell-square, London, W.C. 1.

Royal Sanitary Institute.—A prospectus of the lectures and demonstrations to be delivered during the autumn term has been issued, and can be obtained from the offices, 90, Buckingham Palace-road, London, S.W. 1. An introductory lecture will be given to the students of the several courses by Prof. H. R. Kenwood, Deputy Chairman of the Council, on Monday, Sept. 24th, at 5.30 P.M., in the Institute. The sanitary officers' course comprises the subjects scheduled for the examination of the Institute and the Sanitary Inspectors' Examination Board. The practical training for meat and food inspectors includes the inspection of meat at a cattle market, with demonstrations on live cattle and sheep, slaughtering and dressing of animals, &c. The lectures for health visitors and child welfare workers are arranged as a preparation for the health visitors' examination of the Institute. This course is open to all students who wish to attend, but only those who hold the nursing and midwifery qualification recognised by the Board of Education can be admitted to the examination.

Maudsley Hospital.—A course of lectures and practical courses of instruction for a diploma in Psychological Medicine (Part II.) will be held at this hospital, Denmark Hill, London, S.E., during the session. Eight lectures on Morbid Psychology will be delivered by Dr. Edward Mapother on Mondays at 2.30 P.M. and 4.30 P.M., commencing Oct. 8th; eight lectures on the Psychoneuroses, by Dr. Bernard Hart, on Mondays at 3.30 P.M. and 5.30 P.M., commencing Nov. 5th; six lectures on the Pathology of Mental Diseases, including Brain Syphilis, its Symptomatology and Treatment, by Sir Frederick Mott, F.R.S., on Tuesdays at 4.30 P.M., commencing Nov. 6th; five lectures on the Legal Relationships of Insanity and Treatment, by Dr. C. Hubert Bond, on Oct. 9th, 11th, 16th, 23rd, and 25th, at 4.30 P.M.; eight lectures on the Practical Aspect of Mental Deficiency, by Dr. F. C. Shrubsall, on Wednesdays at 2.30 P.M., commencing Oct. 10th, and on Tuesdays at 2.30 P.M., commencing Nov. 6th; six lectures on Crime and Insanity, by Dr. W. C. Sullivan, on Wednesdays at 4.30 P.M., commencing Oct. 10th, and on Thursdays at 4.30 P.M., commencing Nov. 8th and 15th; six lectures in Clinical Psychiatry, by Dr. Mapother, on Wednesdays at 2.30 P.M., commencing on Nov. 7th; twelve Clinical Demonstrations in Neurology, by Sir Frederick Mott, and Dr. F. L. Golla, on Thursdays at 2.30 P.M., commencing Oct. 11th. The first six demonstrations will be given by Sir Frederick Mott at Camberwell Infirmary; the second six will be given by Dr. Golla at the Hospital for Paralysis and Epilepsy, Maida Vale, on Thursdays at 2.30 P.M., commencing Nov. 22nd. Inquiries as to lectures, &c., should be addressed to the Director of the Pathological Laboratory at the hospital.

Radcliffe Infirmary, Oxford.—A post-graduate course will be held as usual this year in the week Oct. 1st–6th. There will be morning clinics and demonstrations, and in the afternoon two 1½ hour sessions. A detailed programme will be sent on application to Dr. W. T. Collier, 48, Woodstock-road, Oxford, or Dr. Hugh Whitelocke, 6, Banbury-road, Oxford, joint hon. secretaries.

Sociological Society.—A course of six lectures on the Bearing of Psycho-Analysis upon Sociological Problems will be held at Caxton Hall, Westminster, on consecutive Tuesdays, beginning Tuesday, Oct. 9th, at 8.30 P.M., when Dr. Ernest Jones will give an introductory lecture. Subsequent lectures, entitled "Man the Individual," "The Family," "Politics," "Education," "Vocation," will be given by Dr. James Glover, Mr. J. C. Flugel, Dr. M. D. Eder, Miss Barbara Low, and Miss E. Sharpe respectively. Applications for tickets should be made to the Secretary, Psycho-Analytical Lecture-Course, Leplay House, 65, Belgrave-road, Victoria, London, S.W. 1.

North-East London Clinical Society.—The programme for the session 1923–24 is as follows: On Oct. 4th, at 4.15 P.M., Dr. G. F. Still will give the opening lecture on Common Errors of Diagnosis in Diseases of Children. On the 11th the annual dinner will be held at The Prince of Wales's Hospital, Tottenham, at 8 P.M. for 8.15 P.M. On Nov. 7th Dr. F. H. Kyngdon on Early Experiences in Practice, followed by a discussion and exhibition of cases by members of the Society. On Dec. 6th Mr. E. M. Atkinson will read a paper on the Significance of Hæmaturia and its Investigation. On Jan. 2nd, 1924, Dr. T. Rushbrooke will give Reminiscences from General Practice; and on Feb. 7th Mr. W. Ibbotson will discuss the Relation of the Central Nervous System to the Ear, Nose, and Throat, in Health and Disease. On March 5th a paper will be read by Dr. F. J. Tresilian on Old Drugs and New; and on April 3rd one by Dr. L. R. Yealland on the Rôle of Neurology in General Practice. On May 7th Dr. H. C. Samuel will speak on Some Common Errors in the Diagnosis and Treatment of Diseases of the Skin, and on June 5th Mr. N. B. Fleming will discuss Ocular Manifestations of Disease Elsewhere. The meetings will be held at 4.15 P.M. at the Prince of Wales's Hospital, Tottenham.

Medical Society of London.—The syllabus of the first half of the session 1923–24 has now been issued. On Oct. 8th, at 8 P.M., the annual general meeting will be held, followed at 8.30 P.M. by an ordinary meeting, when Dr. Herbert Spencer will give his presidential address on Some Changes in Obstetric Practice since the Foundation of the Medical Society of London. On Oct. 22nd, at 8.30 P.M., there will be a clinical evening, with an exhibition of cases and radiograms. On Nov. 12th, at 8.30 P.M., a discussion on Constipation—its Causes, Results and Treatment from the General Practitioner's Point of View will be introduced by Dr. H. Des Vœux, followed by Dr. Walter Broadbent, Dr. Chittenden Bridges, Dr. D. M. Barcroft, Dr. W. W. Stocker, Dr. Edward Furber, Dr. Percy Spurgin, Dr. Moreland McCrea, and others. On Nov. 26th, at 8.30 P.M., a discussion on the Treatment of Acute Suppurative General Peritonitis will be introduced by Mr. Sampson Handley, followed by Mr. James Berry, Sir Cuthbert Wallace, Mr. Garnett Wright, Mr. H. Carson, Mr. R. P. Rowlands, Mr. V. Z. Cope, and others. On Dec. 10th, at 8.30 P.M., a discussion on Intracranial Hæmorrhage in New-born Children, its Pathology, Effects, Treatment, and Results, will be introduced by Mr. Eardley Holland and Dr. H. Charles Cameron, followed by Dr. Farquhar Buzzard, Mr. Laming Evans, Dr. Sidney Owen, Mr. H. A. T. Fairbank, Dr. J. B. Mennell, Dr. L. G. Phillips, and Dr. E. Bellis Clayton.—The Lettsomian lectures on the Treatment of Pulmonary Tuberculosis will be delivered in February and March, 1924, by Dr. R. A. Young, and the annual oration will be delivered in May, 1924, by Mr. Wilfred Trotter. The hon. secretaries for the year are Mr. T. P. Legg and Prof. F. Langmead; the house of the society is at 11, Chandos-street, Cavendish-square, W. 1.

Manchester's Public Health Committee.—The multifarious activities of the sanitary section are set forth in a report recently issued covering the period from April 1st, 1922, to March 31st, 1923. There are 28 sets of tables and 24 sections dealing with subjects ranging from complaints made by the medical officer of health, the police, and the public (the number of complaints of nuisance dealt with was 10,274), to inspection of drains, the abatement of nuisances of various kinds—dairies and milkshops, ice-cream manufacture (510 in number), public lavatories, workshops, canal boats, unhealthy dwellings, offensive trades, and adulteration of food and drugs. Houses let in lodgings or occupied by more than one family number 2403, to which 23,369 day and 302 night visits were made. The number of infectious cases dealt with by the inspectors was 7974. Four inspectors were specially employed to deal with the nuisance arising from the emission of black smoke, and 111 cases were reported where the emission had been two minutes or more in the half hour's observation. Sixty-seven cases were referred to the justices and in the remaining cases the offenders were cautioned. The bakehouses number 642, and of these 47 are situated in basement premises. As regards the adulteration of food and drugs the percentage of samples adulterated has increased from 2·95 last year to 3·40 this year. The highest percentage of adulteration (12·82 per cent.) seems to obtain in mineral waters, cordials, &c., followed by milk, 7·7. The inspector for carrying out the Canal Boats Acts inspected 1899 boats during the year. The number of insanitary dwellings certified was 55. An average of 442 lodgers per night were accommodated at the Municipal Lodging House for Men (cubicles 467) and 195 per night of women at Ashton House (cubicles 210).

Presentation to a Medical Man.—Dr. Adolph Bronner, who has been for 34 years honorary surgeon to the Royal Eye and Ear Hospital, Bradford, and whose father was one of the founders of the hospital, was presented on his retirement from the post, by the Lord Mayor, Alderman T. Snowden, in the Council Chamber on Sept. 13th, with two travelling bags and a gold cigarette case. A tablet recording Dr. Bronner's services has also been placed in the hospital. The surplus of the money subscribed was handed to Dr. Bronner, who expressed his intention of buying with it something useful for the institution with which he has been so long connected.

Financial Needs of Leeds Hospitals.—Owing to the fact that the Leeds Infirmary has a very heavy bank overdraft amounting to £54,500, and increasing at the rate of £60 a day, it has been determined to make a special appeal to the business establishments and trades of the city on behalf of the infirmary and the other three principal hospitals—the Hospital for Women and Children, Leeds Maternity Hospital, and the Public Dispensary. To this end the city has been divided into 20 areas, and every firm will be visited with a view to enlisting the financial aid of chiefs and staffs alike to liquidate the debt.

The late Dr. W. Case, J.P.—Dr. William Case, born at Aylsham, near Norwich, in 1863, died on July 30th at Durban after an operation. He had been Government District Surgeon at Harding, Alfred County, Natal, for 18 years. Educated at King's College Hospital, London, Dr. Case arrived in Natal in 1896. For a short period he undertook the duties of house surgeon at Grey's Hospital, Pietermaritzburg. He then became successively the Government District Surgeon at Eshowe, Zululand, Paulpietersburg, and finally at Harding, where he has practised since 1905. Dr. Case was a lover of sport, and was for three years president of the Alfred Company Agricultural Society. Much sympathy is felt for the widow and son, Mr. Leslie Case.

The late Dr. John McMurray.—The death of Dr. John McMurray took place at his residence at Bootle on Sept. 12th at the age of 66. After a distinguished medical career at Queen's College, Belfast, in the early 'eighties he took the M.Ch. and M.D. degrees of the Royal University of Ireland. He held several appointments as house surgeon and resident medical officer in institutions in Liverpool, and then settled in Bootle, where he was for a time honorary surgeon of the Bootle Borough Hospital. He was also a J.P. of the borough, and Mayor of Bootle in 1897–98. Dr. McMurray occupied a prominent position in the borough and served for years on the borough council; and his work as a medical man was mostly among the working classes with whom he was very popular for his kindly manner and his robust geniality. He was an enthusiastic Freemason, being P.M. of the Hamer Lodge in 1893.

Donations and Bequests.—By the will of the late Mr. R. Beck, of Swansea, the testator left, among other bequests, 3000 £1 5½ per cent. Cumulative Preference shares of Baldwins, Limited, to the Swansea General and Eye Hospital; 1000 such shares each to the Y.M.C.A., the Institution for the Blind, Swansea, and the Deaf and Dumb Institution; 500 each to the Discharged Prisoners' Aid Society, Swansea, and the Invalid Asylum, Stoke Newington, London, N. The residue of the estate, after certain family trusts have been made, will be divided into 100 parts—each roughly amounting to about £1000. This residue will be distributed among certain institutions, including 20 parts each to the Swansea University College and the Swansea General and Eye Hospital; 5 parts each to University College Hospital, London, Dr. Barnardo's Homes, and the National Benevolent Institution, London, E.; 3 parts to the Hospital for Women, Stoke Newington, London, N.; 2½ parts each to the Royal Wolverhampton Orphanage, the Glyn Vivian Blind Institution, the Royal National Lifeboat Institution, and the Children's Home, Bonner-road, Victoria Park, London.—Under the will of the late Mr. J. P

Bauer, of Manchester, the following among other bequests are made: £1000 to the Manchester Royal Infirmary, to endow a bed to be called the "James Bauer bed"; £100 each to St. Mary's and South Hospital, and Ancoats Hospital and Dispensary; and £50 each to the Manchester Jewish United Sisters Maternity Society, and the Manchester Jewish Kosher Kitchen at the Manchester Royal Infirmary.—Mr. Thomas Frederic Harrison, shipowner, of Liverpool and Windermere, left £500 each to the Westmorland County Hospital, Kendal, Liverpool Royal Infirmary, Liverpool Northern Hospital, Liverpool Southern Hospital; and £250 each to the Stanley Hospital, Liverpool, and the Children's Infirmary, Liverpool.—The Manchester Children's Hospital during the past month received donations to the amount of £1589, including £1388 from the Hospital Sunday Fund.—As a result of the garden party held in July over £500 have been handed over to the Lord Mayor of Manchester's Two Million Shillings' Fund for the city hospitals.

MEASUREMENT OF PROGRESS IN PUBLIC HEALTH.—A lecture with this title will be delivered by Sir Arthur Newsholme on Oct. 4th, at 5 P.M., at the London School of Economics and Political Science, Houghton-street, Aldwych, W.C. 1.

UNIVERSITY COLLEGE HOSPITAL.—Past and present students of the hospital will hold their annual dinner on Friday, Oct. 5th, at the Hotel Cecil. Tickets (12*s.* 6*d.*) can be obtained from Mr. Gwynne Williams and Dr. T. R. Elliott at University College Hospital Medical School.

FATAL ACCIDENT TO GALWAY MEDICAL MAN.—Dr. George O'Kelly, of Mountbellew, County Galway, was recently killed in a motor accident. While he was driving in answer to a medical call, a dog ran under his car and the steering gear went out of order. The car mounted a ditch and overturned on Dr. O'Kelly, killing him instantaneously. He had been medical officer of Mountbellew for 13 years, and was held in high respect.

FOREIGN DECORATION.—The King has given Dr. James Ferguson Lees, C.B.E., Director-General of the Egyptian Public Health Administration, His Majesty's Royal licence and authority to wear the Insignia of Grand Officer of the Order of the Nile, which decoration has been conferred upon him by the King of Egypt.

DUBLIN LABOUR DISPUTE AND SUPPLY OF DRUGS.—An impasse has arisen in regard to the supply of drugs to the Dublin Union. It appears that the contractors, a Dublin firm of manufacturers, have some dispute with their employees, and are at present employing non-union labour. When they delivered a supply of drugs to the union, certain of the employees of the guardians refused to handle them, and the drugs had to be removed by the contractors' men. The representatives of labour requested the guardians to purchase their drugs from a firm employing only union labour, and suggested the name of a Liverpool firm. The guardians, however, have no power to purchase otherwise than from their contractor, and the contract does not terminate until Sept. 30th. The net result appears to be that the patients in the union hospital are deprived of medicines.

A LINK WITH FLORENCE NIGHTINGALE.—Mr. Alfred George Wilkinson, M.R.C.S., L.S.A., who qualified in 1857 and who died at Northampton on Sept. 14th in his eighty-ninth year, was a student at Birmingham when the Crimean War broke out. He volunteered for service and served principally at the Barrack Hospital at Scutari, attending the wounded after the charge of the Light Brigade at Balaclava. Mr. Wilkinson had been in practice at Northampton since 1870 and three years ago was presented with a testimonial by his fellow-townsmen. He had been attending patients up to a week before he died and was confined to his bed for only four days.

THE LATE DR. WILLIAM WHITE, J.P.—Dr. White died suddenly at Hadfield on August 31st at the age of 72. A native of Laxton, Notts, where his forbears had resided for over 200 years, Dr. White was educated at Newark-on-Trent and at Aberdeen University, where he graduated M.B., C.M. in 1876, and M.D. in 1878 with honours. Dr. White practised for a few years at Wooley Bridge and in 1884 settled at Hadfield, where he spent the remainder of his busy and useful life. In 1911 he was chosen an Alderman of the Borough of Glossop, then Mayor for the year 1912–13, and Deputy Mayor for nine subsequent years. His services were specially valuable in all matters connected with sanitation and health; besides holding other offices he had been a Justice of the Peace from 1897. Dr. White was much loved in the district in which he worked for 40 years and his memory will long be cherished. Both his sons studied medicine at the University of Manchester, Captain White being killed in the war, while Dr. Charles Francis White is assistant medical officer at the Port of Liverpool.

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith-road, W.

MONDAY, Sept. 24th.—10 A.M., Mr. Maingot: Surgical Pathology. 12 noon, Mr. Simmonds: Applied Anatomy. 2 P.M., Mr. Addison: Surgical Wards.

TUESDAY.—10 A.M., Mr. Steadman: Dental Dept. 12 noon, Dr. Burrell: Chest Cases. 2 P.M., Mr. Sinclair: Surgical Out-patients.

WEDNESDAY.—10 A.M., Dr. Saunders: Medical Diseases of Children. 12.15 P.M., Dr. Burnford: Medical Pathology. 2 P.M., Mr. Gibb: Eye Dept.

THURSDAY.—10 A.M., Dr. Grainger Stewart: Neurological Dept. 12 noon, Mr. Simmonds: Demonstration of Fractures. 2 P.M., Mr. MacDonald: Genito-urinary Dept.

FRIDAY.—10 A.M., Mr. Dudley Buxton: Dental Dept. 2 P.M., Dr. Burrell: Medical Out-patients. 2 P.M., Mr. Banks-Davis: Nose, Throat, and Ear Dept.

SATURDAY.—9.30 A.M., Dr. Burnford: Bacterial Therapy. 10 A.M., Dr. Saunders: Medical Diseases of Children. 10 A.M., Mr. Banks-Davis: Operations on Throat, Nose, and Ear.

Daily, 10 A.M. to 6 P.M. Saturdays, 10 A.M. to 1 P.M., In-patients, Out-patients, Operations, Special Departments.

ST. MARY'S HOSPITAL MEDICAL SCHOOL POST-GRADUATE COURSE.

SATURDAY, Sept. 29th.—10–11 A.M., Dr. C. L. Fitzwilliams: Early Diagnosis of Cancer of the Breast. 12–1 P.M., Mr. S. Maynard Smith: Chronic Pain in the Right Side of the Abdomen. 2–3 P.M., Sir William Willcox: Chronic Rheumatic Toxæmia. 3–4 P.M., Dr. R. Miller: Demonstration of Cases of Cœliac Disease.

SUNDAY, Sept. 30th.—10.30 A.M., Dr. C. M. Wilson: Investigation of Dyspepsia. The Treatment of Diabetes.

MANCHESTER FRENCH HOSPITAL, 24, Acomb-street, Whitworth Park, Manchester.

THURSDAY, Oct. 4th.—4.30 P.M., Dr. N. C. Haring: The Spahlinger and other Methods of Serum Treatment in Pulmonary Tuberculosis.

Oct. 11th.—Dr. A. C. Magian: The Treatment of Painful Menstruation.

Oct. 18th.—Mr. R. R. Kerr: The Surgery of Injured Fingers.

Oct. 25th.—Dr. A. C. Magian: The Treatment of Irregular Menstruation.

Appointments.

ECCLES, H. A., M.D. Lond., has been appointed House Physician to the Royal Infirmary, Sunderland.

SANDILAND, E. L., M.B., B.S. Lond., D.P.H., Medical Superintendent to the East Lancashire Tuberculosis Colony, Barrowmore Hall, near Chester.

Vacancies.

For further information refer to the advertisement columns.

Aberystwyth Infirmary, &c.—H.S. £200.
Benenden (Kent) National Sanatorium.—Res. Asst. M.O. £250.
Bromley and Sevenoaks Rural District Councils.—M.O.H. £1000.
Central London Throat, Nose, and Ear Hospital, Gray's Inn-road, W.C.—Three Registrars.
Epsom, The Manor.—Jun. Asst. M.O. £432.
Hospital for Sick Children, Great Ormond-street, W.C.—H.P. and Asst. Cas. O. £50.
Ipswich County Borough.—Sen. Asst. M.O.H., &c. £600.
Kingston-upon-Hull City and County.—R.M.O. £400.
Leicester City.—Asst. Tuberculosis O. £600.
London County Mental Hospital Service.—Seventh Asst. M.O. £432.
London Jewish Hospital, Stepney Green, E.—Hon. Asst. P., Hon. S. Also Asst. to Out-Patients. £100.
Manchester Northern Hospital for Women and Children.—Hon. S.
Manchester Royal Infirmary.—R.M.O. £200.
Newcastle-on-Tyne Dispensary.—Hon. Phys.

Newcastle-upon-Tyne City Hospital for Infectious Diseases.—Res. Med. Asst. £350.

Nottingham Education Committee.—Jun. Asst. Med. Insp. £500.

Oswestry, Shropshire Orthopædic Hospital.—Res. Surg. O. £500. Two H.S.'s. £250.

Plaistow Fever Hospital, Samson-street, E.—Sen. Asst. M.O. £430.

Prince of Wales's General Hospital, Tottenham, N.—H.S. £150. H.P. £150. Also Jun. H.S. and Jun. H.P. £110 each.

Royal Free Hospital, Gray's Inn-road, W.C.—Cas. O. £100.

South London Hospital for Women, Clapham Common, S.W.—Temp. Asst. P.

South Mimms, Barnet, Clare Hall Hospital and Sanatorium.—Asst. M.O. £350.

Staffordshire General Infirmary, Stafford.—H.P. £150.

Walsall General Hospital.—Sen. H.S. and Jun. H.S. £200 and £150 respectively.

West Bromwich and District Hospital.—Res. Asst. H.S. £180.

Western Ophthalmic Hospital, Marylebone-road, N.W.—Sen. and Jun. H.S.'s. £150 and £100 respectively.

Wolverhampton and Staffordshire Hospital.—Res. M.O. £150.

York City Mental Hospital, Fulford.—Asst. M.O. £500.

The Chief Inspector of Factories, Home Office, S.W., announces a vacant appointment at Mid-Calder, Edinburgh.

Births, Marriages, and Deaths.

BIRTHS.

Broster.—On Sept. 11th, at Winn-road, Southampton, the wife of L. R. Broster, M.Ch., F.R.C.S., of a daughter.

Eason.—On Sept. 11th, at the Superintendent's House, Guy's Hospital, the wife of H. L. Eason, C.B., C.M.G., M.D., of a daughter.

Forrest.—On Sept. 13th, at 10, Coates-crescent, Edinburgh, the wife of A. W. Forrest, M.A., M.D., D.P.H., Public Health Department, Wandsworth, of a daughter.

McMorland.—On Sept. 13th, at Brookfield, Colyton, Devon, the wife of Dr. J. Bruce McMorland, of a daughter.

Walker.—On Sept. 8th, at Kuliang, China, the wife of Dr. Ronald R. Walker, of a son.

MARRIAGES.

Worger—Gaskins.—On August 20th, at The Church of The Sacred Heart, Burnham-on-Sea, William Worger, M.R.C.S., L.R.C.P., to Edith Gaskins, second daughter of A. A. A. Wotzel, Esq., O.B.E., of Belmont, Sutton, Surrey.

GOLDEN WEDDING.

Larkin—Wood.—On Sept. 17th, 1873, in the Choir of Saint Saviour's, Southwark (Southwark Cathedral), by the Revd. Samuel Benson, M.A., chaplain, assisted by the Revd. Daniel Moulhin, B.A., rector of Holy Trinity, Trinity-square, S.E., Jane Maria, second daughter of the late William Wood, M.R.C.S. Eng. and L.S.A. Lond., of Trinity-square, S.E., to Frederick George Larkin, F.R.C.S. Eng., L.R.C.P. & L.M. Edin., of Trinity-square, S.E., and Grove Park, Kent, youngest son of the late Richard Larkin, of Maypole, Hoath, near Canterbury.

DEATHS.

Farnell.—On Sept. 16th, suddenly, Henry Dawson Farnell, F.R.C.S., of Grasmere, Eastbourne, aged 71 years.

Jackson.—On Sept. 14th, at the Freemasons Hospital, London, John Charles Jackson, late Medical Officer for Health of Fulham, in his 71st year.

Manning.—On Sept. 12th, suddenly, in London, Joseph Vincent Manning, M.D., late of Bloemfontein, South Africa.

Martin.—On Sept. 15th, at Bournemouth, Surgeon-Colonel W. T. Martin, A.M.S., retd., in his 82nd year.

Norris.—On Sept. 9th, at Garmelow, Eccleshall, Edward Stacy Norris, M.A., M.B., late of Eton, aged 71.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

The late Mr. H. D. Farnell.—On Sept. 16th Eastbourne lost one of its oldest medical practitioners by the death of Dr. Henry Dawson Farnell. He had been in practice in the town since 1878, and was respected and esteemed by everyone with whom his work brought him in contact. Dr. Farnell was born at Salisbury 71 years ago. He studied medicine at University College, London, and became M.R.C.S. Eng. in 1874 and F.R.C.S. in 1885. For three years he was house surgeon at the Liverpool Northern Hospital, after which he settled at Eastbourne. He was one of the oldest members of the medical staff of the Princess Alice Memorial Hospital. In 1894 he was placed on the Commission of the Peace for the borough. During the war Dr. Farnell did much voluntary work at the local Red Cross Hospital, also at Summerdown Convalescent Camp, and was subsequently given the O.B.E. He married in 1881 Miss Mary Colgate, daughter of Mr. Robert Colgate, F.R.C.S., also of Eastbourne.

Notes, Comments, and Abstracts.

A MEDICAL STUDENT'S IMPRESSIONS OF SOME CONTINENTAL HOSPITALS AND THEIR METHODS.*

By G. E. C. Collis.

A party of some 17 senior medical students, representing universities in London, Edinburgh, Oxford, Manchester, Glasgow, Liverpool, and Leeds, undertook this autumn a three weeks' tour of the principal continental university towns. Our itinerary included Brussels, Leyden, Berlin, Dresden, Vienna, Prague, Munich, Zurich, and Paris; everywhere we were welcomed by local students and given facilities to inspect medical work. It might be of interest to record a few of the impressions we received, the points which in medical or surgical practice struck us as interesting, either because of their difference from or similarity to those in vogue in Great Britain. Of necessity such a tour precludes any detailed study of continental methods, but nevertheless a bird's-eye view can be gained of hospital accommodation and appliances, of the quantity and type of the clinical material, and most important of all, one meets the men who are working in these centres. Perhaps one's first observation is not the differences but the essential similarities which exist between British and foreign hospitals and medical men. The similarity of structure and routine of the former; of the type, mode of thought, and outlook of the latter.

Hospital Accommodation.

The hospitals visited varied from the new and as yet unoccupied premises of Leiden, which embody the accumulated experiences of European and American institutions, to the centuries old Salpêtrière in Paris, a transformed pre-revolutionary jail. The continental hospitals as a whole struck us as being much better supplied with gardens and surrounding parks than similar institutions in this country. There, however, the ward accommodation is much more restricted. In some places there is scarcely room to walk between the beds, and the centre of the floor is frequently occupied by beds back to back. Gymnasia containing mechanical appliances were very much in evidence in all the hospitals of German-speaking towns, especially Vienna, where there is a separate apparatus for both active and passive exercise of each group of muscles in the body.

A Treatment for Pelvic Exudates.

A form of treatment for pelvic exudates not in general use in this country was seen in Vienna. The patient is placed in the lithotomy position with the pelvis raised, and a rubber bag, resembling a small Champetier de Ribes's bag, containing 1 kgm. of metallic mercury, is inserted into the posterior fornix and left in position 10–15 minutes. Pressure of the bag combined with the respiratory movements of the patient give the effect of "internal massage." The treatment is repeated every two or three days. This mercury bag is also used to assist in the replacement of the retroverted uterus. The dorsal position is everywhere used for the examination of patients, the Sims very seldom.

In Leiden and Vienna we were shown the obstetric forceps designed by Kalen of Christiania. These superficially resemble the long curved forceps, differing in the shape of the blade. The advantages claimed are that they are easier to apply in high forceps deliveries and can always be applied to the biparietal diameter. In the maternity clinic in Vienna, the axis traction forceps have been abandoned in favour of this type for the past 12 months.

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* The tour of which the above impressions are recorded was arranged by the National Union of Students of Great Britain. This body exists to represent English and Welsh students both nationally and internationally, Scotland having a union of its own on similar lines, and is a member of the Confederation Internationale des Etudiants (C.I.E.) to which the national unions of some 20 European countries are affiliated. The C.I.E. is concerned with the interests of university students the world over, and through it the unions of the different countries are brought into permanent contact. This facilitates the work of arranging a welcome for students going to study at foreign universities, as well as holiday tours, correspondence exchanges, &c. As an example of what is done the English National Union has this year arranged—in addition to the medical tour of Europe described above—tours of agricultural students to Denmark, of engineering students to Czecho-Slovakia, and general holiday visits to France, Belgium, Germany and Hungary. In every case the English party, which contained both men and women students, has been conducted and entirely looked after by students of the country visited. This has not only enabled them to meet and get to know foreign students, but has resulted in making the tours very cheap. Results have been uniformly successful.

Hydrotherapy and Heliotherapy in Vienna.

We visited the institute for Continuous Hydrotherapy. This form of treatment is employed in all cases of generalised dermatitis, especially salvarsan dermatitis, for neurological cases with bed sores and contractures, septic cases—e.g., ungating carcinoma of the rectum and appendix abscess. One of this last type of case had been in the bath continuously or 18 months. In the same building we saw the Wagner-Jauregg malaria-salvarsan treatment for syphilis.

Heliotherapy for pulmonary tuberculosis in children was seen in the department of pediatrics. The main roof of the building is asphalted, and a wooden roof about 6 feet wide placed round two sides. Under this roof are the cots. The children are kept out throughout the year, although in Vienna there may be 20 degrees of frost in winter.

The radiographic installations in all the places visited were of the most modern type, especially those of Zurich. n taking a radiogram, instead of conforming the tube to he patient as is usual elsewhere, the patient is here con-ormed to the tube. This is effected by means of an apparatus similar in principle to the operating table, the head, limbs, &c., being capable of being elevated or lowered.

We were interested to note the wider employment on the continent of local anæsthesia in surgery than is customary n Britain. General anæsthetics are administered by the "closed" method by means of elaborate instruments.

Paris was visited on our return journey, but we were unable to take the fullest advantage of the opportunities offered us there. Time pressed, and, moreover, our powers of observation had become somewhat exhausted, as our our had proved a strenuous though thoroughly enjoyable ne.

Methods of Teaching.

With regard to methods of teaching in medicine, we noticed one important difference between Central Europe n the one hand and France and Britain on the other. In German-speaking countries and in Holland much stress is aid on the laboratory, while in France, as in England, greater attention is paid to the clinical aspects of medicine. To the visitor it is the well-equipped and organised labora-ories which appeal most strikingly. Where the system of eaching is largely clinical, there is little to impress the eye, nd on a hurried visit it is impossible to form a correct stimate of its scope. The value of each method of teaching an only be proved by ultimate results, nor is this the ccasion to discuss that side of the subject. The question f language is one which need not deter the intending student from Britain. Cliniques and lectures are given in English in many of the schools, and particularly in Vienna, where there are at present many Americans, is English argely used. There is an arrangement between some of he American and continental universities whereby assistants re exchanged for periods of 12 months. We met some of hese American assistants in Zurich and Paris.

The chief value of such a tour for medical students lies n the appreciation gained of a wider medical horizon than an be seen from the viewpoint of one particular school. t is of especial service to the senior student or newly qualified man in showing where and on what lines he might pursue is post-graduate studies.

PUBLIC HEALTH IN BIHAR AND ORISSA.[1]

ACCORDING to the census of 1921 the population of this rovince was found to be 34,002,189, not including the tributary States of Orissa, in which vital occurrences are not recorded. The birth-rate was 34·6 per 1000, as compared with 32·2 in 1920, and 30·4 in 1919, showing a further recovery from the conditions prevailing in 1918–20, that were due to the epidemic of influenza, high prices, and food carcity; though considerably below the decennial average f 39·2. In the several districts the ratio varied from 6·9 in Purnea and in Singhbhum to 40·2 in Angul and 40·7 n Monghyr. In the rural areas the ratio was 34·8, ranging rom 26·8 in Darbhanga and 26·9 in Singhbhum to 40·2 in ngul and 40·8 in Monghyr; and in the towns 29·3, ranging rom 13·6 in Balasore and in Dhanbad, to 41·3 in Jamalpur, 2·1 in Hajipur, and 45·3 in Sahibganj. The general death-rate was 32·8, as compared with 30·9 in 1920, 40·0 in 1919, nd 35·6, the decennial average. In the districts of Gaya nd Shahabad the ratios were 53·5 and 53·4 respectively, n Darbhanga and in Santal Parganas 23·7, and in Purnea nly 21·6. In the towns the variations were extreme: at alganj the mortality was 64·7, at Katihar 7·2 per 1000. The infantile mortality, 159·0 per 1000 births, was some mprovement on the corresponding rate (169·5) in 1920. The general death-rate among Hindus, who form the bulk of the population (28,161,118) was 33·5; among Mohammedans 28·0, and among Christians 19·7 per 1000.

Cholera showed a considerable increase from 0·7 deaths per 1000 in 1920 to 2·6 in 1921, this figure being also the average for the decennium (1911–20). In one district only (Angul, population 182,574) was there no death from this cause. The incidence was highest in Gaya rural district, where there were 27,119 fatal cases (13·0 per 1000), the adjoining Patna district, with 17,810 deaths (12·9) being similarly affected. Lieut.-Colonel W. C. Ross, I.M.S., Director of Public Health, who submits this report, is "strongly of opinion that the epidemic prevalence of cholera is largely associated with the prevalence of flies, and that good conservancy and the rapid removal of excreta (in which flies lay their eggs and breed) are fully as important measures for the prevention of cholera as the provision of pure water-supplies, and that both these preventive measures should be widely adopted if cholera is to be prevented as an epidemic disease." Such measures must be decentralised and carried out locally by the district boards and municipalities. The conditions most favourable for fly-breeding appear to be a mean temperature of about 85° and a humidity over 70 per cent. Heavy rainfall saved the situation early in August, and cholera immediately began to abate. The total cholera deaths amounted to 90,688, of which 26,710 occurred in July and 38,568 in August; in September they fell to 6724. Small-pox showed considerable improvement, 0·2 deaths per 1000, compared with 0·6 in 1920; in Palamau district the mortality was 0·9, and in Patna 0·8; in Angul district there was not a single death from this disease. The report states that "vaccination is the best, and the only real, means of prevention of small-pox; there is no doubt but that the cost of vaccination work is a splendid and profitable investment of public funds. . . . It would therefore appear to be wise and proper to organise the work more effectively, and to make vaccination compulsory and free, in order to get the whole population protected, and thus abolish a disease which is, of all diseases, the most easily and cheaply preventable." This is without doubt the proper course to pursue, and it is to be hoped that the executive authorities will support the Director of Public Health in the manner indicated.

The fever statistics (22·6 deaths per 1000, compared with 22·0 in 1920, and a decennial average of 23·3) varied in the rural districts from a mortality of 12·0 in Puri to 37·5 in Shahabad; and in the towns from 5·5 in Katihar to 30·7 in Gaya. During 1920 and 1921, 83,266 children were examined for enlarged spleen; the percentage found was 11·58. In the three districts of Muzaffarpur, Darbhanga, and Monghyr the ratios were found to be 0·56, 0·56, and 0·50 respectively, while in Singhbhum, Angul, and Balasore the ratios were 56·62, 65·55, and 68·29. "The prevention of malaria and hookworm constitutes the most important, and at the same time the most difficult, problem in the public health administration of the province." Colonel Ross considers that it is not practicable to prevent malaria, or reduce it permanently or on a large scale, by quinine; non-productive operations, such as draining, levelling, oiling of water surfaces, &c., are not feasible on a large scale over an enormous area. "What is wanted is a policy of malarial prevention which will pay its own way. . . . Such a policy is being carried out in Italy and Spain; it consists in combining agricultural improvement with sanitation, by draining or flooding marshes and wet lands in a scientific manner, so as to produce larger crops, and at the same time reduce the breeding of mosquitos." The Government of Bengal is now moving in this direction, and a similar action is suggested in Bihar and Orissa. The expense, of course, would be great, but the return would undoubtedly be remunerative.

The plague death-rate was 0·4 per 1000, compared with 0·5 in 1920 and 1·2 the decennial average. The districts of Patna (1·6 deaths per 1000), Saran (1·3), and Darbhanga (1·1) were most affected; Orissa division was entirely free. The towns, with a mortality ratio of 1·5 per 1000, suffered more than the rural districts (0·4). "The only preventive measure of real practical value is evacuation, which is now carried out by the people themselves in the majority of places." But "the better and permanent way would be to make the houses so that the rats were compelled to leave." With regard to respiratory diseases, from which the mortality was 0·2 per 1000, the same as in the preceding year, and in the decennium, it is stated that the toxin of influenza precipitates an attack of acute malaria in the many patients who harbour the malarial parasite, leading to a complicating pneumonia, which often proves fatal; quinine should therefore be given to prevent this complication. Dysentery and diarrhœa caused a death-rate of 0·8 in the rural districts and 1·6 in the towns; in the former, Puri and Cuttack districts suffered most with ratios of 5·3 and 5·0 respectively; in the towns, Puri (8·5), Jajpur (5·8), and Sambalpur (5·8). This prevalence is attributed chiefly to the bad state of the water-supply in Orissa division. In regard to hookworm disease (from which it has been found that approximately two-thirds of the population of Bengal are suffering, as well as large numbers in the districts of the United Provinces adjoining Bihar), investigations have been carried out at the Patna Lunatic Asylum, in several jails, and on a large scale among the mining population of Jharia ; from 50 to over 70 per cent. of those examined have been found to be affected. Local conditions of overcrowding and general filth, as happens in the temporary collection of large numbers of coolies in construction works, lead to the spread of the disease. Its prevention "is very largely an economic question, and, unless it is considered and attacked from that point of view, little or nothing can be done to deal with it." In a subsequent section of the report (para. 54) Colonel Ross emphasises the point that "Public Health is purchaseable, and the people will only obtain the quantity and quality for which they are prepared to pay. . . . In other words, public health is fundamentally an economic question." The three essential factors are economic progress, education of the people, and legislation. "The greatest is the need for economic progress. . . . The wherewithal must be provided, otherwise the work cannot be done." This may be admitted ; but, on the other hand, it must also be acknowledged that a population living under insanitary conditions cannot be healthy, and therefore cannot perform the work, or produce the results that would be obtained by a similar population living under healthy conditions ; and it has been established over and over again that expenditure on sanitary works, properly carried out, justifies itself in the most decisive manner, and to the fullest extent.

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[1] Patna, Superintendent, Government Printing, 1922.

(*To be continued.*)

THE NATURE AND USE OF THE AIR.

Few stories in the history of science are more romantic than that of the discovery of the nature and use of the air. Its importance to chemistry, physics, and physiology is inestimable, and it is pleasing to think that several of our own countrymen have taken a conspicuous place in this important phase of the history of science. The modesty of Boyle, the genius of Mayow, the careful thoroughness of Black and Hales, and the patience of Priestley, misguided phlogistonian though he was, are lessons not easily forgotten. Miss C. M. Taylor has well summarised the subject in a little book entitled "The Discovery of the Nature of the Air, and of Its Changes during Breathing" (London: G. Bell and Sons, Ltd. 1923. Pp. 84. 1*s.* 6*d.*), a really excellent little volume which should have an instant success.

POLISHED RICE AND BERI-BERI.

Dr. F. E. Wood, in the medical report (1922) of the Federated Malay States, makes some interesting observations on the effects of increased consumption of polished rice among the Chinese and Malay population. It appears that since polished rice is now more easily obtainable than it was two or three years ago, the Chinese are reverting to it in preference to undermilled rice. The Malay natives are following their example, since the polished rice is both cheaper and more attractive than the more wholesome variety. As a result, beri-beri has greatly increased in the last two years. During the war the incidence of beri-beri was particularly low as, Dr. Wood states, owing to the shortage and control of rice, the Chinese were driven to employ other foodstuffs. Steps are being taken to warn the people of the dangers of polished rice as compared with undermilled or parboiled rice. Extract of rice polishings made by the Institute for Medical Research at Kuala Lumpur is now freely used in the treatment of beri-beri cases. It is especially useful in acute cases and undoubtedly tends to shorten the course of the disease.

VACCINATION IN THE N.W.F. PROVINCE, INDIA.

Lieut.-Col. W. M. Anderson, Director of Public Health in the North-Western Frontier Province, in his report for the year 1922–23, comments on the satisfactory increase in the number of vaccinations. The total number of operations (vaccinations and re-vaccinations) performed in the settled districts and agencies during the year amounted to 144,155, compared with 100,219 in 1921–22, thus showing an increase of 43,936 ; of this total 11,505 appear to have been unsuccessful. The successful primary vaccinations were at the rate of 40·31 per mille, the average for the preceding four years being 36·98. This is also a great improvement in the numbers of re-vaccinations. The incidence of small-pox has fallen concurrently ; during the past quinquennium the average annual number of deaths was 805 and the mortality per 1000 of the population was 0·37. During the year under report there were 118 deaths from small-pox, giving a ratio of 0·05 per 1000 of population. Colonel Anderson states that vaccination is gradually becoming more popular among the rural population and resistance to primary vaccination is not offered. The glycerinated chloroform lymph used was procured from the Punjab Vaccine Institute throughout the year.

A HYGIENIC BREAST-PUMP.

We have received a specimen of the Aspirateur Tourtier (9, rue du Regard, Paris), which is a breast-pump made entirely of glass and rubber, easy to manipulate and sterilise. Suction is produced by simple withdrawal of a piston, and the pressure can be released at any moment by removing an indiarubber stopper. The invention, it is stated, has been adopted at a number of the principal maternities in Paris, and it may be of service in the case of weaklings where neither mother nor nurse can carry out the hand-expression which is the usual practice in this country. It may also prove of use for women who are obliged to go out to work and for the purpose of obtaining breast milk from a wet-nurse for other babies, as is now practised widely in America and has recently been tried with success at the Manchester Children's Hospital. The price of the apparatus is given as 10*s.*, and it can be obtained in this country through the Sole Agent, Tourtiers Aspirators, 70, Victoria-street, London, S.W.1.

LONDON DOCTORS AND DENTAL SURGEONS, 1923–24.

This new directory, by reason of its size, its red cover and its style of printing calls to mind the Dentists' Register issued under the direction of the Dental Board. It is, however, a complete list of legally qualified (registered) physicians and surgeons and of graduates and licentiates in dental surgery, practising in Greater London, including Bromley, Croydon, Ilford, Kingston, Richmond, Surbiton, and Woodford. The General Medical Council has officially advised the publishers that this work conforms to its requirements, and the directory actually includes all additions to the Medical and Dental Registers up to May 31st last. The information given in the 300 pages is allocated under the following five headings: (1) Name, chief professional qualifications, and date of registration (with partnerships, if any) ; (2) addresses, telephone numbers, consulting and visiting hours ; (3) description of practice ; (4) nature of work ; (5) chief hospital or public medical appointment, (*a*) present, (*b*) late. The matter is neatly and attractively set out and we have noticed few errors for a new work of this scope. The name, however, of one well-known surgeon lacks a vowel. An avowed purpose of the volume is to bring the profession and public into closer contact, and while being of service to the practitioner at the same time to render the profession more accessible to the laity who, without being confused by a burden of detail, may rapidly find the data they seek. The Grafton Publishing Co. (Chichester House, Chancery-lane, W.C. 2) proposes to issue the directory annually. The price is 15*s.* 6*d.*

Messrs. W. and G. Foyle, Ltd. (booksellers, 121-125, Charing Cross-road, London, W.C.) have sent us a new catalogue of Department No. 9, containing recent and secondhand books on medicine, surgery, nursing, and pharmacy. The list is classified into general and special subjects and contains books both new and old, some of the latter now being not readily obtainable. The list should prove useful to that large circle of medical students who would like to read more than they can afford to buy at published prices.

W. J. H. D.—There are several institutes interested in any new suggestions for the treatment for cancer—e.g., the Cancer Hospital (Free), Fulham-road, London, S.W. 3, the Middlesex Hospital (Cancer Research Laboratories), London, W. 1, the Imperial Cancer Research Fund, 8–11, Queen-square, Bloomsbury, London, W.C. 1. The remarkable find might be submitted to one or other of these.

Messrs. Baillière, Tindall and Cox (8, Henrietta-street, London, W.C.) have issued a list of Works on Dentistry, published and sold by them, containing the names of more than 100 books and journals classified under subject headings. In each case the date of publication is given.

Corrigendum.—Dr. H. B. McCaskie informs us that the remarks on antenatal precepts attributed to him in our report of the Section of Obstetrics, B.M.A. (The Lancet, Sept. 15th, p. 562) were not made by him. He holds exactly opposite views on the subject of antenatal examination.

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CONTENTS

THE WHOLE OF THE LITERARY MATTER IN THE LANCET IS COPYRIGHT.

THE EFFECT of X Rays of Different Wave-lengths upon Some Animal Tissues: Proof of Differential Action. By Prof. S. Russ, D.Sc., F.Inst.P.—(*Illustrated*) . 637

ORIGINAL ARTICLES.

Traumatic Intestinal Rupture. By Grant Massie, M.B., B.S., F.R.C.S. 640
A Case of Complete Decerebrate Rigidity in Man, with Observations on Various Reflex Reactions. By F. M. R. Walshe, M.D., F.R.C.P.—(*Illustrated*) 644
The Relation Between the Growth-promoting and Anti-rachitic Functions of Certain Substances. By H. Goldblatt, M.D., and S. S. Zilva, D.Sc.—(*Illustrated*) 647
Prenatal Care and Puerperal Mortality. By A. Leyland Robinson, M.D., F.R.C.S. 649
The Diathermy Treatment of Gonorrhœa in Women. By A. E. Milner, M.R.C.S., and A. K. Maclachlan, M.B., Ch.B. 652

REVIEWS AND NOTICES OF BOOKS.

The Medical Profession in India. By Maj.-Gen. Sir Patrick Hehir, K.C.I.E., C.B., C.M.G., I.M.S..... 653
The Pathological Physiology of Surgical Diseases. By Prof. Dr. Franz Rost. Translated by Stanley P. Reiman, M.D. 654
Chirurgie de la tête et du cou, Précis de technique opératoire. By Ch. Lenormant and Pierre Brocq 654
Prognosis of Internal Diseases. By Prof. Henry L. Elsner, M.D., LL.D. 654
Les Hépatites Amibiennes: Autochtones et Coloniales et Leur Traitement. By F. Françon and J. Hutinel 654
Recent Psychology and the Christian Religion. By Cyril E. Hudson, M.A... 654
Evolution of the Conscious Faculties. By J. Varendonck, D.Litt., D.Sc.... 655
Traité de pathologie médicale et de thérapeutique appliquée. Diagnostics de laboratoire. II. Tumeurs, par Prof. M. P. Masson 655
Life of Sir T. P. Anderson Stuart, M.D. By William Epps 655
A Green Old Age. By Prof. A. Lacassaigne. Translated by Herbert Wilson 656
Military Surgeon 656

LEADING ARTICLES.

The Coming Insurance Settlement 657
The Care of the Mentally Deficient.. 657
Differential Action of X Rays 658
Ayurveda and Unani ... 659

ANNOTATIONS.

The Centenary of The Lancet 659
Primary Carcinoma of the Thymus 659
The Welfare of the Blind. 660
Auto-Pyo-Therapy 660
The Milne Treatment of Scarlet Fever 661
The Registrar-General's Report for 1921 661
A Standard for Mental Hospitals 661
A Central Medical Institute for Paisley 662
Distribution of Acromegalic Stigmata......... 662
Board of Control: Annual Report 662
London Medical Exhibition 663

MODERN TECHNIQUE IN TREATMENT.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

XXXVIII.—The Treatment of Glycosuria in Pregnancy. By George Graham, M.D., F.R.C.P. 663

SPECIAL ARTICLES.

Studies on the Pneumococcus: The Medical Research Council Report 665
Vital Statistics for 1921: The Registrar-General's Review.—(*Illustrated*) .. 666
The Meeting of the British Association: Section of Physiology.—Section of Anthropology 668
Indigenous Systems of Medicine in India: Report of the Madras Committee: Ayurvedic "Humoral" Theory.—Indian Methods of Diagnosis 669
Insulin Medication: A Compendium of Experiences: Recovery of Tolerance.—Diabetic Coma.—The Effects of Dextrose and Lævulose.—Results from Switzerland and Germany.—Standardisation of Insulin 671

PUBLIC HEALTH SERVICES.

Reports of Medical Officers of Health: Northamptonshire.—Warwickshire.—Cambridgeshire.—Cumberland.—East Suffolk.—West Suffolk.—Fife 673

CORRESPONDENCE.

Cancer and Diet (Dr. S. Monckton Copeman) ... 675
Probability and Extra-sensorial Channels of Knowledge (Dr. Major Greenwood) 675
A Plea for the Nationalisation of Our Mental Hospitals (Dr. A. T. W. Forrester) 676
Injury and Diseases of the Articulations (Dr. H. Warren Crowe) 678
The Causation and Treatment of Pruritus Ani (Major F. J. W. Porter) 678
The Milne Treatment of Scarlet Fever (Dr. A. H. G. Burton) 679

OBITUARY.

Margaret Boileau, M.B., B.S. 679
The late Mr. H. D. Farnell 679

THE SERVICES.

Changes in the Directorship of the Medical Services.—Royal Army Medical Corps.—Indian Medical Service.—Royal Air Force.—Deaths in the Services 680

MEDICAL NEWS.

Fellowship of Medicine and Post-Graduate Medical Association 680
Royal Sanitary Institute.. 663
Guy's Hospital Biennial Dinner 680
Central London Throat, Nose, and Ear Hospital. 680
National Hospital for the Paralysed and Epileptic, Queen-square, Bloomsbury, W.C. 680
Medical Defence Union .. 681
St. Thomas's Hospital ... 681
Medico-Legal Society..... 681
Medical Sickness, Annuity, and Life Assurance Society 681
Pharmaceutical Society of Great Britain 681
National Institute for the Blind 681
Charing Cross Hospital Medical School 681
Psychological and Physical Development of the Child.................. 681
Donations and Bequests . 681
Cromer Cottage Hospital . 681

NOTES, COMMENTS, AND ABSTRACTS.

The Position of the Friendly Societies 683
A Maternity Nursing Home on Hospital Lines...... 683
Public Health in Bihar and Orissa.—(*Concluded*).... 683
The Treatment of Whooping-cough with Artificial Sunlight 684
The Spas of Western England and Central Wales 684
Combined W.C. Trap and Soil-pipe Branch....... 684

Medical Diary 681
Appointments 682
Vacancies................ 682
Births, Marriages, Deaths. 682

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The Effect
OF
X RAYS OF DIFFERENT WAVE-LENGTHS UPON SOME ANIMAL TISSUES.

PROOF OF DIFFERENTIAL ACTION.[*]

BY S. RUSS, D.SC., F.INST.P.,
JOEL PROFESSOR OF PHYSICS IN THE UNIVERSITY OF LONDON.

(From the Cancer Research Laboratories, Middlesex Hospital.)

IN a paper[1] upon the germicidal action of ultra-violet rays, it is shown that a marked differential action exists in this part of the spectrum—i.e., electromagnetic disturbances have a different effect upon the same kind of organism according to the wave-length operating. It was found that when micro-organisms were exposed to the ultra-violet and visible radiation from a tungsten arc for a considerable period of time germicidal action stopped abruptly at $\lambda = 2960$ Å.U. It was possible in this particular instance to correlate the differential action with a selective absorption by the micro-organisms of just those wave-lengths which had germicidal action upon them.

In attempting to extend this kind of experiment into the region of X rays it soon becomes certain from ordinary electroscopic absorption measurements that this correlation, even if it exists, will not be found, because the absorptive power exhibited by a medium upon a beam of X rays is dependent in so many cases solely upon the mean density of that medium. Hence, if we take a section of some animal tissue the density of which is about the same as water, the absorption which it will exert upon a beam of X rays will be practically the same as that of a layer of water of equal thickness, in spite of the fact that in the layer of tissue the composition varies from point to point according to the cellular structure involved. In order to reveal this point-to-point absorption it would be necessary to construct electroscopic instruments on a microscopic scale.

In view of these difficulties, it was decided to select X rays of a certain restricted range of wave-length, and, in the first place, to expose tissues to measured doses of this radiation. The next step was to go considerably higher in the scale of wave-length, arrange that exactly the same dose of radiation was given, and see whether the same effects were produced. If different, then it would be proved that a differential effect exists; and these experiments support this view. The proviso is inserted here that this differential effect may really be due to a selective absorption of the radiation by some constituent part of the cells, which cannot, of course, be detected by the usual absorption measurements. These experiments have been carried out on the normal skin of the rat and Jensen's rat sarcoma, which, when inoculated subcutaneously, grows progressively in a large percentage of cases. It has been shown in previous papers that the rate of growth of these tumours can be slowed up or completely stopped by accurately adjusting the dose of radiation; if growth is permanently stopped we say that a lethal dose has been given.

In view of the fact that proof of a differential action will depend almost entirely upon the reliability of the physical methods used for measuring the radiation, the subject matter of this paper is divided into two sections, the first of which is devoted to certain physical considerations.

PHYSICAL SECTION.

Ranges of Radiation Used.—The ranges of X ray wave-lengths used have been chosen so that it may be possible to draw conclusions from the observations which will be applicable to radiotherapy. One group of wave-lengths used was that which was emitted by an X ray tube running at an alternative spark-gap of 4 cm. between spheres 5 cm. in diameter; the wave-lengths would range for the most part from about 0·45 to 0·30 Å.U., and reference will be made to them in the text as "soft" X rays. The other group chosen was a comparatively small group of wave-lengths obtained by running the X ray tube at an alternative spark-gap of 10 cm. between the spheres and screening the radiation by 1 cm. of aluminium. Under these conditions the transmitted rays are not far from being homogeneous, with a wave-length of 0·168 Å.U.; reference will be made to them as "hard" X rays. The figures relating to wave-lengths are derived from aluminium absorption measurements.

Definition of the Dose of Radiation.—In this paper it has been decided to take the dose to be measured by the amount of radiation absorbed by the tissue, and it will be referred to in the animal experiments section as the absorption dose. This is different from the usual practice, which is to take the dose as measured by the product of incident intensity and time, where the incident intensity I is the amount of energy incident per second per unit area. The absorbed radiation $A = I\ (1 - e^{-\mu x})$, where μ is the coefficient of absorption and x the thickness of tissue. When the wave-length is changed the value of μ is in general different, so that A and I are not in a constant ratio to one another for different kinds of radiation. In a similar way an electroscope does not measure the energy incident upon it, but only that which is absorbed in it and used to produce ionisation. We can represent this fraction approximately by $A_0 = I\ (1 - e^{-\mu_0 x_0})$. It is the quantity A_0 which is measured by the reading of the instrument. If we assume that A_0 bears a simple proportion to the energy absorbed by the tissue (A), and that this ratio is the same for both "hard" and "soft" rays, then the readings on the electroscope multiplied into the time measure the dose.

Experimental Method of Measuring the Dose.—In applying the method outlined we have to design the electroscope so that the above assumptions shall be most nearly satisfied. It is well known that when a beam of X rays meets an obstacle secondary radiation originates, and the general character of this radiation changes as the incident wave-length is varied. The resulting ionisation in, say, an air space depends upon the general character of the radiation traversing it, so it is clear that the simpler we are able to keep the conditions the more likely we are to avoid the various complications of secondary radiation. For this reason a short air path is used as our standard ionisation chamber, and it is arranged so that in the passage of the beams of X rays through this air path no solid surfaces are struck. In this way secondary and scattered radiation effects are reduced to a minimum, and we can then assume that when an equal ionisation is produced by two beams of different wave-lengths there is an equal expenditure of energy producing such ionisation in the two cases.

The experimental method of measuring the dose of radiation may be seen from Fig. 1. X rays originating at A go along the paths indicated, the vertical beam to an ionisation chamber N connected to an electroscope, which will be called the near electroscope; the horizontal beam to an ordinary gold-leaf electroscope situated in a room about 4 metres away; this will be called the far electroscope. N could be swung in and out of position, and this position, when it was receiving the vertical beam, was that occupied by the experimental material; in this way a measure was always obtained of the radiation to be used, simultaneous measurements being taken at F. When the actual exposure of the tissues took place, N had to be swung out of position, but as there had previously been simultaneous readings on F and N, it was not a difficult matter to ensure that the radiation was of the character and intensity required, for during the exposure, which in some cases lasted over an hour, observations of the intensity at F were made every minute; in this way an invaluable check upon the constancy of the radiation was obtained, and any variations in it were made good by a slight lengthening or shortening of the exposure. F and N were standardised before use on all occasions by means of a known quantity of radium.

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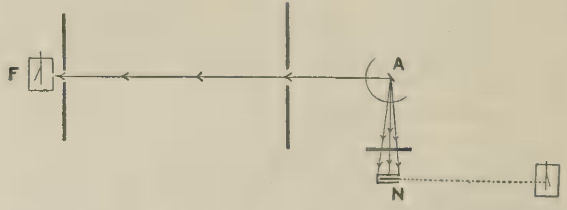
[*] This paper appears in the Proceedings of the Royal Society, B. vol., p. 95, and is here reproduced by permission.

[1] Browning and Russ: Proc. Roy. Soc., B. vol., p. 90 (1917).

Fig. 1.



Effect of Variations in the Ionisation Chamber.—It has already been mentioned that the form of ionisation chamber at N, which we look upon as the standard, consisted of a simple air path. This was obtained by taking a lead cylinder and cutting a small hole in it transversely to its length. Two electrodes were set up vertically within the cylinder, so that the beam of X rays came down between them but without touching them; one was connected by means of a wire to a gold-leaf electroscope about 6 feet away; the other terminal was earthed. The saturation current obtained when X rays of a certain wave-length traversed the air gap was taken to be proportional to the quantity of radiation absorbed. The actual reading when multiplied by the time of exposure constitutes a measure of the dose. When used for measuring X rays of a different wave-length the output can be adjusted to give the same reading on the electroscope, and so equal doses can be given.

The ionisation curves obtained with this air chamber for the two regions of wave-length under investigation are practically identical; see Fig. 2, in which the crosses correspond to "hard" rays and the circles to "soft" rays. This is a graph of a number of simultaneous observations on the near and far electroscopes; by using a diaphragm in front of F it was possible to get identical readings on F with "hard" and "soft," when these beams were giving identical readings on N.

Various ionisation chambers were used and the effect of varying the ionisation chamber at N is shown in Fig. 3. These three graphs were obtained in the manner just described; the ionisation chamber in (*b*) was a shallow wooden box with a central electrode of wood, in (*c*) it was the same box, but the central electrode was of aluminium, and in (*d*) it was a shallow aluminium box with an electrode of the same metal. The graphs show that when equal readings are obtained on the near electroscope, the readings of the far one are higher when dealing with "hard" than with "soft" rays, except when the air ionisation chamber is used.

Table I.

Ionisation chamber used at N.	Ratios of readings of far and near electroscopes for different rays when near electroscope gives uniform readings.
(*a*) Air ionisation chamber only ..	1·0
(*b*) Wood ionisation chamber: wood electrode	1·37
(*c*) Wood ionisation chamber: aluminium electrode	1·73
(*d*) Aluminium ionisation chamber: aluminium electrode	2·03
(*e*) Paper ionisation chamber: aluminium electrode	2·52

Table I. shows the extent to which this is the case. It follows that when we use, say, chamber (*d*), and adjust the readings of N to equality for "hard" and "soft" rays, we are really supplying in equal times doses for "hard" rays 2·03 times as great as for "soft" rays. It might be possible by using a measurin instrument which, owing to secondary radiatio phenomena, specially favours "soft" X rays, that th existence of a differential effect upon animal tissue could be entirely masked. It is not unlikely tha these phenomena have played some part in th observations of Friedrichs,[2] from which he ha concluded that no differential effect upon tissues exist

In view of the fact that the constructional feature of the ionisation chamber may account for suc important differences as appear in Table I. detail are given below of the dimensions of (*a*), (*b*), (*c*), &c They are as follows:—

(*a*) Air gap only—dimensions of gap about 1 × 0·4 × 2 cms

(*b*) Rectangular parallelepiped of wood, external dimension 3·4 cms. long, 1·5 cms. wide, and 0·4 cms. deep, thickness o wood 0·3 mm.

(*c*) Same as (*b*), but electrode of aluminium 0·2 mm. thick.

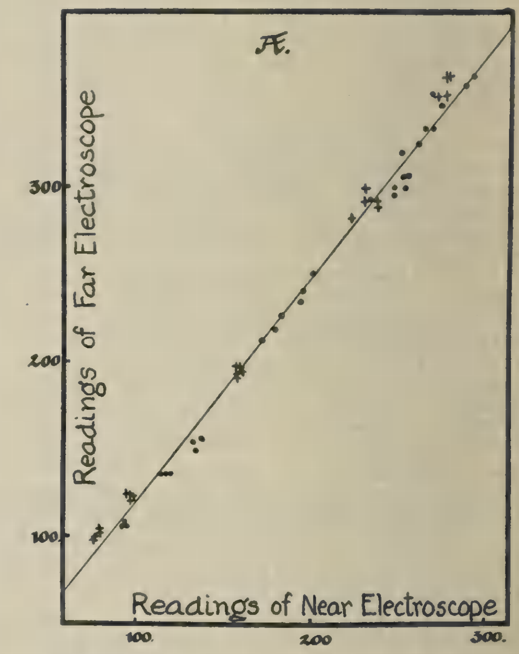
(*d*) Same dimensions as (*b*), but all of aluminium 0·3 mm thick.

(*e*) Cylinder of thin paper about 0·8 mm. thick, length 3· cms., diameter 1·5 cms., central electrode an aluminium wire.

ANIMAL EXPERIMENTS SECTION.

Experiments upon Tumours.—For the tumou experiments the method of exposure was that adopte by Wedd and Russ.[3] A thin slice of tumour abou 1–2 mm. thick is placed between thin sterile mic sheets and exposed to the radiation for the lengt of time desired; small pieces of the tumour are the inoculated into normal rats and the subsequen growth determined by frequent caliper measurements Here again the animal variation has been eliminate as far as possible in the following way. The experimental batches of animals inoculated numbered abou 20, and each rat was usually inoculated with three small pieces of tumour; one had been exposed to "hard" rays, one to "soft," and the control had had no radiation at all.

Fig. 2.



The first step was to find the dose of "soft" X rays which was just sufficient to produce a lethal effect upon the tumour; this gave a certain rate upon the Standard electroscope at N (Fig. 1), and this rate could be accurately duplicated with "hard" X rays, and the corresponding dose of these rays could be given to the tumour. Two pieces cut from the same tumour were exposed, one to an absorptio ose, which was practically a lethal dose, of " soft " rays (exposure 53 minutes), and the other to an qual absorption dose of " hard " X rays (exposure so 53 minutes). Small portions of the irradiated imour were then inoculated into the right and left xillæ of 20 rats and non-irradiated tumour in the ght groin. The Chart (Fig. 4) shows the result ıree weeks later, from which it will be seen that though the absorption dose of " soft " X rays was thal to the tumour, an equal absorption dose of hard " X rays resulted in a very considerable degree growth. The tumours are drawn to full-scale.

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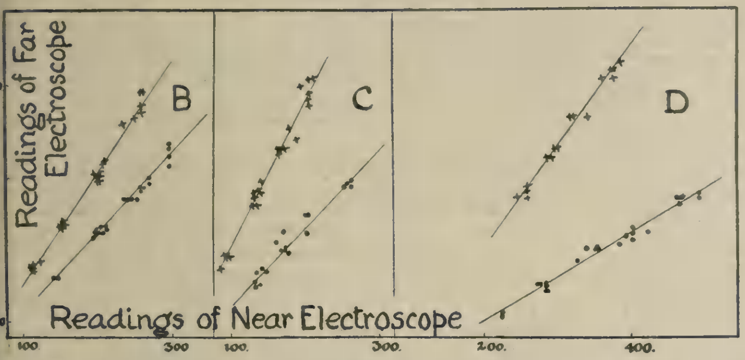
[2] Friedrichs: Physikalische und biologische Grundlagen der Strahlentherapie (1918).

[3] Wedd and Russ: Jour. Pathology and Bacteriology, vol. xvii., p. 1 (1912–13).

FIG. 3.



In the next series of experiments upon the tumour ells it was arranged to find out how much greater ı absorbed dose of " hard " X rays it was necessary give in order to get the same effect as with " soft " ys; the effect sought was a lethal effect upon the ımour. The results in Table II. were obtained under ıese conditions. For any particular time of exposure ıe absorbed dose of " hard " rays was 2·53 *times* as eat as that of the absorbed dose of " soft " rays; spite of this increase in the amount of X ray ıergy absorbed it will be seen that the lethal fect was reached a little sooner with the softer ıdiation, so that this number would not appear to quite large enough as a measure of the differential tion.

Another experimental series undertaken, so that ıe absorbed dose of " hard " rays was 2·74 times as eat as that of the " soft " rays, showed that in this ıse the lethal effect was obtained a little *sooner* ith the " hard " than with the " soft " rays. Two ırther series on the same lines showed that the lethal fect upon the tumour was obtained with " hard " ıd " soft " rays when the absorbed dose of " hard " ys was in one case 2·85 and in the other 2·42 times large as the absorbed dose of " soft " rays.

TABLE II.

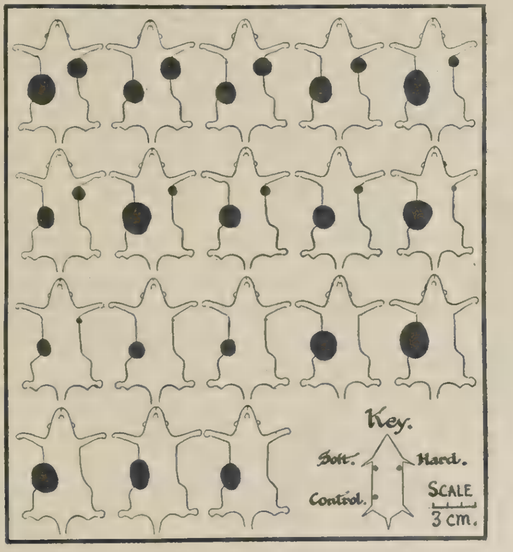
umber of nimals.	Number of control inoculations which grew tumours.	Time in minutes of exposure of the tumour.	Tumour inoculations which grew after exposure to—	
			" Soft " X rays.	" Hard " X rays.
12	9	39	3	9
22	18	50	4	11
12	11	56	1	4
12	8	61	0	1

If we take the whole series into consideration, volving experiments and observations upon about)0 rats, it appears that when a quantity of energy expended in a layer of tumour by a beam of what here termed " soft " X rays, then in order to get ıe same degree of action upon the tumour (namely, revention of growth) with a beam of what is here rmed " hard " X rays, it is necessary to arrange ıat about 2·6 *times* (average of the numbers in the xt) as much energy is expended. This number ay therefore be looked upon as a numerical measure of the degree of the differential action, and might be termed the " therapeutic factor."

Skin Experiments.—In the experiments upon the normal skin the rats were given urethane and exposed to a beam of X rays projected vertically downwards. A lead screen with a square aperture was placed over the animal to localise the exposure. The screen was first placed in such a way that the aperture came between the shoulders of the animal and a dose of " soft " X rays given to this area; the screen was then moved so that the aperture came low down in the mid-line and a measured dose of " hard " X rays given to this area. By exposing two areas of the skin of the same rat, comparisons between the effects of " hard " and " soft " X rays were made more accurate. The rats were generally irradiated in pairs and in order to exclude " local " variations the upper area of one rat and lower area of the other were exposed to the same wave-lengths.

When an animal is irradiated in this way, the radiation which is scattered back from the body of the animal as the primary beam makes its way through it, contributes something to the dose absorbed by the skin. In order to allow for this fraction, when the dose of radiation was measured, a rat was placed just beneath the electroscope so that the back radiation could contribute to the ionisation produced by the direct beam. A difference could be measured with the animal in or out of position, but it only amounted to a few per cent. of the total ionisation. After the X ray exposure, a careful scrutiny was kept of the successive changes in the skin. In some cases the exposures were long enough to produce ulcers which eventually healed; with shorter exposures, the irradiated region was not damaged enough to prevent the re-growth of hair, though in most of these cases there was a loss of pigment.

FIG. 4.



A preliminary series of experiments upon 18 rats on the lines indicated served to show that in order to get the same degree of reaction in the skin it was necessary to give a considerably greater absorbed dose of " hard " than " soft " X rays. The extent of this differential action was more accurately gauged from some further results obtained after the exposure of another series of 48 rats to measured doses of the two types of radiation.

Detailed records were kept of the times at which the various reactions occurred, and in many cases the observations were continued over a period of nearly a year.

TABLE IV.—*Soft X Rays upon the Skin: Time in Days for Various Reactions.*

Time of exposure in minutes.	Epilation.		Blistering.	Healing.	Re-growth of hair.
	Partial.	Complete.			
21 [2]*	18†	—	—	—	61
28 [2]	19–24†	—	—	—	63–80
34 [10]	15–26	33 (1 only)	17 (1 only)	—	40–110
42 [2]	4–11	11–14	11–14	148	148
50 [8]	7–18	14–20	12–20	26–146	42 (1 only)

TABLE V.—*Hard X Rays upon the Skin: Time in Days for Various Reactions.*

Time of exposure in minutes.	Epilation.		Blistering.	Healing.	Re-growth of hair.
	Partial.	Complete.			
30 [2]	40–46‡	—	—	—	—
40 [4]	18–29‡	—	—	—	—
50 [4]	14–23‡	—	—	—	—
75 [2]	59‖	—	—	—	—
90 [4]	11–29	—	—	—	—
100 [4]	21–22	33–36 (13)	—	—	52–59
125 [2]	18	30	—	—	45
150 [2]	20	24	20‡	24–30	36

* Figures in brackets denote number of rats.
† Nearly complete. ‡ Very slight. ‖ Other very slight.

The times of exposure to the "soft" rays ranged from 21–50 minutes and to the "hard" rays from 30–150 minutes, and it was found that a practically identical degree of reaction was obtained in the skin of the rats when the absorbed dose of "hard" X rays was six times that of the "soft"; this number may therefore be taken as a measure of the differential action of the two sets of wave-lengths. If we use the term "therapeutic factor" it is seen that a considerable difference is found for skin and for tumour. In several cases where the general degree of reaction of the skin to "hard" and "soft" rays was about the same (produced, however, by widely different doses) there still seemed some small difference in the nature of the reaction. With the "hard" X rays the onset of the reaction was slower, and the condition of the hair many months later was nearer the normal.

DISCUSSION OF RESULTS.

If the method by which comparison is made of the amounts of energy liberated in the tissues by the two beams of X rays under consideration is a valid one, then the results show that when equal amounts of X ray energy are absorbed from beams of different wave-lengths by animal tissues, the reactions of these tissues may differ considerably in degree and possibly to some extent in nature.

The conclusions reached have some bearing in radiotherapy. The experiments show that a bigger differential effect between "hard" and "soft" X rays exists for the skin of the rat than for the tumour cells. Provided this also holds for the human subject it is one argument for the use of very hard X rays or γ rays when tumours at a considerable depth below the skin have to be irradiated. The conclusion would perhaps be just the reverse in superficial conditions not involving the irradiation of normal skin.

The result also raises the question whether the specification which has been adopted by Seitz and Wintz [4] for expressing the carcinoma dose in terms of the skin dose is sufficiently rigorous, for this may be a function of the wave-length.

The two main results obtained are that about six times as much short wave-length energy as long wave-length energy must be expended in a layer of skin in order to produce equal reactions and that this factor falls to about 2·6 in the case of the tumour. We may question whether these are not cases in whic the molecular configuration, apart from the atomi is more affected by electrons of low than of hig velocity. The experiments of C. T. R. Wilson [5] hav produced direct evidence of the part which th electrons liberated in the track of a beam of X ray play in ionisation, and it would not be irrational t suppose that the slower electrons which would b released by the longer wave-length can give rise t more pronounced effects in the tissues than th quicker ones liberated by the shorter wave-length even though a similar expenditure of energy occu in the two cases.

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[4] Seitz and Wintz: Die Röntgentiefentherapie (1920).

[5] Wilson: Proc. Roy. Soc., A. vol., p. 85 (1911).

TRAUMATIC INTESTINAL RUPTURE.

BY GRANT MASSIE, M.B., B.S. LOND.,
F.R.C.S. ENG.,
SURGICAL REGISTRAR, GUY'S HOSPITAL.

INTESTINAL rupture, without penetration of th abdominal wall, sometimes referred to as subcutaneou rupture, is not an accident of common occurrence The 34 cases upon which this report is based wer collected from the records of Guy's Hospital betwee the years 1899 and 1923, a comparatively long period

Situation of Rupture.

Stomach	4	
Duodenum	3	
Duodeno-jejunal junction	1	26
Jejunum	14	
Ileum	8	
"Small intestine"	3	
Cæcum	1	

The majority of ruptures clearly occur in the smal intestine, and the comparative immunity of th stomach, the duodenum, and the colon is striking Regarding rupture of the small intestine, the jejunum was more commonly injured than the ileum, and o the 14 jejunal lesions 7 were found within 18 inche of the duodeno-jejunal junction, an occurrence whic cannot be entirely explained by chance. Othe writers have found that whereas the jejunum i commonly injured in its first 3 feet, the ileum i commonly injured in its last 3 feet. Unfortunately of the ruptures of the ileum in this series the exac situation was only mentioned in three cases. In two of these it was 4 feet from the ileo-cæcal valve, and in the third 2 feet from the valve.

It is difficult to account for the frequency of lesions in the upper part of the jejunum without supposing that the small intestine, in its upper part at any rate bears some more or less constant relationship to the vertebral column, against which it is crushed by the force applied to the abdominal wall. Mall[1] has stated that the six primary loops of small intestine occupy definite positions within the abdomina cavity, while Grégoire[2] and many other anatomists believe that this is also true of the intestine in its final state of development. It is certainly very suggestive that it is the second or third loop of the jejunum which is commonly injured at the point at which it crosses the vertebral column.

Character of the Lesion.

Of the ruptures of the duodenum, two showed complete transverse division, and all were associated with other severe injuries in the upper abdomen. In the small intestine the majority of the lesions were partial ruptures—that is, the continuity of the bowel was not completely divided, although all its coats were involved. Of the nine cases of complete transverse division, seven were in the jejunum and two were in the ileum.

It is noteworthy that, whereas all the cases of rupture of the stomach and the duodenum were complicated by other injuries, usually intra-abdominal, those with rupture of the small intestine, with the exception of two, were uncomplicated by any such injury. The lesion was usually single. Five cases occurred in which there was a double lesion. In these the perforations were usually close together, although in one case they were separated by a distance of 5 feet. In many of the cases of multiple perforations of this kind already reported the patient has been kicked by a horse, and it has been suggested that these injuries were due to the impact of the two ends of the hoof. In only one of the five cases in this series was the injury due to a kick; in another the patient was crushed between the buffers of a train, and it is possible that the same explanation may also apply here.

The extent of the rupture is of great importance, and it is by no means impossible that small perforations should become sealed off by the adhesion of the great omentum, aided by the eversion of the mucosa so typical of intestinal rupture. The following case illustrates the possibility of this happening:—

CASE 26.—A man of 28 was struck in the abdomen by the open door of a goods van while working on the railway. On admission he complained of great abdominal pain, and the abdomen was both rigid and tender. His pulse was 66 and there was some vomiting, which continued until the following day, when it seems that his condition somewhat improved. Twelve days later he developed definite signs of intestinal obstruction and operation became necessary. On opening the abdomen it was found that the omentum had become adherent to the ileum at one point, thus forming a band which was the cause of the obstruction. The patient died, and at autopsy it was found that the bowel had been ruptured at the point at which the omentum had become attached. It is reasonable, therefore, to assume that similar cases occur in which perhaps the patients are more fortunate in escaping the dangers of intestinal obstruction. Without the complication recovery in this case might well have been complete.

Injury to the Mesentery.

The complication of injury to the mesentery is found, according to Moynihan,[3] in 10 per cent. of cases. In most cases it does not appear to influence the prognosis except when the mesentery is torn from the bowel along the line of its attachment. This condition, termed by Sencert[4] "mesenteric disinsertion," has received little attention from surgical writers hitherto, but it deserves notice, since it may profoundly modify both diagnosis and prognosis of the case in which it occurs. The following cases illustrate the possible results of this injury:—

CASE 12.—A man of 27 fell from a telegraph pole on which he was working a distance of about 50 feet. On admission the abdomen was rigid and his pulse was 96; liver dullness was normal. Within three hours there was marked pallor and the abdomen was greatly distended, suggesting the diagnosis of internal hæmorrhage. On laparotomy the jejunum was found disinserted for a distance of about 4 inches, and close to this was a small rupture of the bowel. "Several branches of the superior mesenteric artery were bleeding furiously."

CASE 31.—In this patient, a girl of 3, who had been run over by a light cart, internal hæmorrhage was not a feature of note. The patient complained of great pain and the pulse rose to 160. On laparotomy it was found that in addition to two ruptures, both of which were small, the bowel had become separated from its mesentery and was gangrenous. This necessitated resection, and the patient died.

The immediate consequence of mesenteric disinsertion therefore is hæmorrhage, which may in itself be sufficient to cause death; the more remote consequence is gangrene, which carries with it so high a mortality. Sencert,[4] in reviewing this aspect of intestinal rupture, was able to find only 30 recorded cases, but probably it is a complication far more common than these findings would suggest.

Nature of the Violence.

The cause of the injury was as follows:—

Run over	16	Kicked	2
Crushed	7	Knocked down	2
Struck by various objects	6	Fall	1

In the majority of cases the force applied was direct—that is, it compressed the anterior abdominal wall, crushing the bowel on the vertebral column. In two cases the force applied was indirect, and in each the patient was struck in the lumbar region, from where in some way the violence was transmitted to the abdominal contents. E. J. Senn[5] has reported and discussed two similar cases; in his own case a woman of 26 fell in the snow, striking her right buttock. Signs of peritonitis later appeared, and on opening the abdomen he found a small rupture of the ileum in the lower part of the pelvis. In the second case, reported by F. J. Bottomley,[5] the patient was struck beneath the angle of the left scapula and sustained a rupture of the duodeno-jejunal junction.

Cases 12 and 33 illustrate this peculiar type of injury. In the first, already referred to as showing the results of mesenteric disinsertion, the patient fell 50 feet, striking his right lumbar region and bruising the iliac crest. At operation a small perforation was found in the jejunum in addition to the injury to the mesentery, which has already been described. In the second case the patient was struck in the back by a railway engine. The lumbar muscles were severely contused, several of the lumbar spines were fractured, and there was also a fracture-dislocation of the third lumbar vertebra. It is indeed extraordinary that with such extreme violence the only resulting injury within the abdomen was a single rupture of the jejunum of no great size.

The mechanism of this type of injury is difficult to explain, and Senn came to the conclusion that it was due to "violent momentary vibrations in a coil of intestine overdistended with fluid contents." It seems that by this explanation Senn imagined that the affected coil was for the moment isolated from the segment above and below; if this is the case, however, it clearly cannot apply to the first of the above-mentioned patients, for no change affecting only the contents of a loop of intestine could possibly separate it from its mesentery. It seems more likely that trauma applied to the lumbar region causes a violent hyperextension of the lumbar column and consequently a tightening of the anterior abdominal wall. The bowel may well be crushed, therefore, in this type of injury, in exactly the same way as it is in the more usual case of direct violence.

It has already been pointed out that injury to the stomach and the duodenum was frequently associated with laceration of the liver, pancreas, or spleen, complications which patients with rupture of the small intestine usually escaped. The upper abdomen is relatively well protected by the downward projection of the thoracic wall, which covers it laterally and to a great extent in front. The contents of the pelvis are to some extent also protected by its bony walls, but not entirely so, since the pelvis is directed both upwards and forwards. It is clear, then, that the part of the abdomen most liable to injury is that which lies between these extremities; most writers on the subject agree that the dangerous area of the abdomen is that below the umbilicus, where the forward projection of the lumbo-sacral curve is most marked.

Signs and Symptoms.

In reviewing the signs and symptoms of intestinal rupture presented by the cases in this series it becomes evident that no one sign or symptom can be regarded as in any way diagnostic of the condition in its early stages. In nearly all the cases the predominating feature at the time of admission was pain, shock, or rigidity of the abdomen.

Pain.—This was very marked in most cases, and although sometimes localised was usually diffuse. Generally it appeared at the time of the injury, but in a few cases it was delayed. The pain usually increased in severity until operation was undertaken, although in one case it disappeared within a few hours of the injury. In this patient laparotomy was undertaken within seven hours of the injury, and death seems to have been due to shock.

Shock.—This was evident in the majority of cases, and was so marked in a few that it precluded operation.

TABLE I.—THIRTY-FOUR CASES OF TRAUMATIC INTESTINAL RUPTURE.

No.	Age and sex.	Dates of (*a*) accident, (*b*) admission, (*c*) discharge or death.	Nature of injury.	Symptoms and signs.	Treatment.	Result.	Condition found at operation or post mortem.
1	8 F	(*a*) 11/8/02 (*b*) 11/8/02 (*c*) 11/8/02	Run over by light van.	Abdomen rigid. Liver dullness absent. Right and left flank distended.	No operation.	D*	Rupture of stomach and upper pole of spleen. Peritonitis.
2	8 M	(*a*) 26/4/10 (*b*) 26/4/10 (*c*) 26/4/10	Run over by cart.	Abdomen rigid on left side. Pt. vomited blood. Pulse 120.	Laparotomy 17 hrs. after admission.	D	Rupture of stomach and pancreas. Large quantity of free blood in abdomen.
3	6 F	(*a*) 28/5/10 (*b*) 28/5/10 (*c*) 28/5/10	Run over by motor-car.	Abdomen rigid in epigastrium. Much pain and vomiting. Rigidity increased. Pulse rose to 120.	Laparotomy 2 hrs. after injury. Rupture sutured.	D	Rupture of stomach near cardia; 4 to 5 oz. of blood-stained fluid in abdomen.
4	7 M	(*a*) 28/6/20 (*b*) 28/6/20 (*c*) 2/7/20	Knock on back of head by motor-van.		No operation.	D	Fracture of base of skull. Rupture of lesser curvature of stomach.
5	5 M	(*a*) 24/12/02 (*b*) 24/12/02 (*c*) 24/12/02	Run over by hansom cab.	"Signs of abdominal injuries."	Operation refused.	D	Rupture of duodenum. Fracture of femur.
6	14 M	(*a*) 3/6/10 (*b*) 3/6/10 (*c*) 4/6/10	Run over by cart.	Much abdominal pain. Little bruising.	Laparotomy. Suture of duodenum.	D	Duodenum completely severed intraperitoneally. Fracture of spine.
7	5 M	(*a*) 28/9/22 (*c*) 28/9/22	Run over by light van.	Pt. greatly shocked. Band of bruising across epigastrium. Abdomen rigid and tender. Liver dullness at first normal, later diminished.	No operation.	D	Complete rupture of duodenum. Liver and spleen lacerated. Fracture of many ribs.
8	20 M	(*a*) 24/3/17 (*c*) 26/5/17	Crushed between pole of wagon and post.	Abdomen extremely rigid and distended; extreme pain; pulse 72; no bruising.	Laparotomy. Suture of rupture. No drainage.	R	Partial rupture at duodeno-jejunal junction.
9	9 M	(*a*) 6/2/02 (*b*) 6/2/02 (*c*) 7/2/02	Run over by van.	Much collapse; vomiting; pulse feeble.	Laparotomy. Suture of rupture.	D	Partial rupture of jejunum 13 in. from the duodeno-jejunal junction.
10	50 M	(*a*) 3/8/03 (*b*) 3/8/03 (*c*) 3/8/03	Playing with lad of 16, who accidentally sat on his abdomen.	No immediate pain. Later pt. vomited. Pulse 140. Dullness developed in left flank.	Operation refused.	D	Partial rupture of jejunum in two places, 4 ft. and 9 ft. from pylorus. Peritonitis.
11	33 M	(*a*) 13/9/05 (*c*) 14/9/05	Struck in abdomen by crane.	Much pain. Pulse 76, on following morning 108.	Laparotomy on following morning. Suture.	D	Partial rupture of jejunum just beyond its commencement. Laceration of pancreas.
12	27 M	(*a*) 29/9/05 (*b*) 29/9/05 (*c*) 30/9/05	Fall of 50 ft. from telegraph pole. Struck right lumbar region.	Abdomen rigid. Liver dullness normal. Pulse 96. Three hours later much distension and marked pallor. Bruise of right iliac crest.	Laparotomy 5 hrs. after admission. Suture and ligature of mesentery.	D	Partial rupture of jejunum. About 1 in. away mesentery of bowel completely separated from its attachment for 4 in. Several branches of sup. mesenteric artery bleeding furiously.
13	29 M	(*a*) 1/5/08 (*b*) 2/5/08 (*c*) 6/6/08	Kicked by horse.	Vomited at once and throughout the following night. Much pain. Rigidity.	Laparotomy. Suture, irrigation, No drainage.	R	Partial rupture of jejunum about 5 in. from duodeno-jejunal junction.
14	9 M	(*a*) 23/2/10 8 A.M. (*b*) 23/2/10 2 P.M. (*c*) 8/4/10	Crushed between two carts.	Abdomen rigid and tender. Pulse rose, 130.	Laparotomy 14½ hrs. after. Suture, drainage.	R	Partial rupture of jejunum about 18 inches from duodeno-jejunal junction.
15	21 M	(*a*) 30/12/15 9 P.M. (*b*) 31/12/15 5.30 P.M. (*c*) 5/2/16	Run into by barrow.	Walked to hospital. Slight bruise on abdomen which was tender and rigid. Pulse 132.	Laparotomy. Suture, drainage.	R	Partial rupture of the first part of jejunum. Much brownish fluid in abdomen.
16	30 M	(*a*) 25/5/99 (*b*) 25/5/99 (*c*) 27/7/99	Crushed between pole and wall.	Acute pain. Abdomen retracted and immobile.	Laparotomy 2¾ hrs. after injury. Anastomosis with Murphy's button.	R	Complete rupture of the jejunum.
17	50 M	(*a*) 22/5/01 (*b*) 22/5/01 (*c*) 23/5/01	Hit on abdomen by piece of marble weighing 15 cwt.	Extreme pain, which later disappeared. Much shock. Rigidity.	Laparotomy 7 hrs. after injury. Murphy button anastomosis.	D	,, ,,
18	47 M	(*a*) 29/6/04 (*b*) 29/6/04 (*c*) 30/6/04	Crushed between two barges.	Very collapsed. Much pain. Abdomen rigid. Left side dull. Pulse 100.	No operation.	D	Complete rupture of jejunum. Rupture of pancreas. Fat necrosis. Peritonitis.
19	18 F	(*a*) 6/5/08 (*b*) 6/5/08 (*c*) 7/5/08	Run over by heavy cart.	Much shock. Pulse 116. Swelling of left side of abdomen due to percussion.	Laparotomy. Murphy button anatomosis.	D	Complete rupture of jejunum near commencement. Much blood in abdomen.
20	23 F	(*a*) 26/8/12 (*b*) 26/8/12 (*c*) 27/8/12	Run over by motor-bus.	Much abdominal pain. Vomiting.	Laparotomy immediate. Rupture not found.	D	Complete rupture jejunum. Laceration of omentum and mesentery.
21	12 M	(*a*) 20/10/22 (*b*) 20/10/22 (*c*) 20/10/22	Run over by lorry.	Extreme shock. Abdomen rigid and tender. Vomited a good deal of blood.	No operation.	D	Complete rupture of jejunum. Laceration of liver and pancreas.
22	29 M	(*a*) 12/2/23 (*b*) 12/2/23 (*c*) 14/2/23	Crushed between cart and wall.	On admission diffuse pain, no rigidity. Pulse 100. After 24 hours it rose to 120, with signs of peritonitis.	Laparotomy. Enterostomy.	D	Complete rupture of jejunum. Peritonitis and fat necrosis.
23	? M	(*a*) 8/9/99 (*b*) 8/9/99 (*c*) 9/9/99	Run over by trolley.	Much pain, rigidity; liver dullness normal. On following day pulse rose to 142. Dullness developed in lower abdomen.	Laparotomy. Suture.	D	Partial rupture of ileum. Much free blood in abdomen.

TABLE I.—THIRTY-FOUR CASES OF TRAUMATIC INTESTINAL RUPTURE—(*Continued*).

No.	Age and sex.	Dates of (*a*) accident, (*b*) admission, (*c*) discharge or death.	Nature of injury.	Symptoms and signs.	Treatment.	Result.	Condition found at operation or post mortem.
24	22 M	(*a*) 4/1/99 (*b*) 4/1/99 (*c*) 5/1/99	Crushed between buffers of train.	Abdomen rigid. Much pain. Liver dullness impaired; dullness in left flank.	Laparotomy 26 hrs. after injury. Resection.	D	Partial rupture of ileum in two places 3 in. apart, about 4 ft. from ileo-cæcal valve. Peritonitis.
25	10 M	(*a*) 10/10/07 (*b*) 10/10/07 (*c*) 29/12/07	Run over by cart.	Abdomen rigid. Much pain. Bruise on right side. Vomited blood. Pulse rose to 124.	Laparotomy on following day. Suture and drainage.	R	Partial rupture of ileum in two places.
26	28 M	(*a*) 18/3/09 (*b*) 18/3/09 (*c*) 31/3/09	Struck by door of goods van.	Much pain, especially in right iliac region. Abdomen rigid and very tender. Pulse 66. Condition same on following day, with some vomiting. Pain and rigidity continued 11 days, when vomiting again started.	Laparotomy 13 days later. Omentum adherent to small rupture of ileum. Separated.	D	Omentum had become adherent to ileum, sealing the perforation but producing intestinal obstruction 12 days later.
27	42 M	(*a*) 6/1/13 (*c*) 9/1/13	Struck in abdomen by heavy weight of coal.	Abdomen very rigid. Pulse 84. Vomiting persisted and pulse-rate rose to 130.	Laparotomy. Suture.	D	Rupture of ileum for about half its width at the anti-mesenteric border. Peritonitis.
28	51 M	(*a*) 28/1/20 (*b*) 28/1/20 (*c*) 15/3/30	Kicked on abdomen.	Much pain and thirst. Abdomen rigid. No vomiting. Pulse 88.	Laparotomy 2 hrs. after admission. Suture, drainage.	R	About 2 pints of blood-stained fluid in the abdomen; two small partial ruptures of ileum about 2 ft. from ileo-cæcal valve on mesenteric border.
29	? M	(*a*) 20/4/99 (*b*) 20/4/99 (*c*) 21/4/99	Hit on abdomen by iron pipe.	Much pain, marked rigidity. Liver dullness normal.	Laparotomy on following day. Suture.	D	Complete rupture of ileum.
30	49 M	(*a*) 31/8/03 (*b*) 31/8/02	Run over (intoxicated) by brewer's dray.	Much collapse.	Operation refused.	D	Complete rupture of ileum about 4 ft. from ileo-cæcal valve. Other viscera normal. Little peritonitis.
31	3 F	(*a*) 25/10/10 (*b*) 26/10/10 (*c*) 29/10/10	Run over by light cart.	Much pain. Bruising on left side. Persistent vomiting. Pulse rose from 114 to 160.	Laparotomy. Suture. Resection and anastomosis with Murphy's button.	D†	Two small ruptures of small intestine. At one point mesentery separated from bowel, which had become gangrenous. Resection necessary.
32	11 M	(*a*) 22/7/99 (*b*) 22/7/99 (*c*) 22/7/99	Run over by cart.	Abrasion of abdominal wall. Marked rigidity. Impaired liver dullness.	Laparotomy 2 hrs. after injury. Resection of 12 in. of bowel. Anastomosis.	D	Two partial ruptures of small intestine.
33	30 M	(*a*) 4/10/04 (*b*) 4/10/04 (*c*) 4/10/04	Knocked down by railway engine.	Contusion of lumbar muscles on right side, and multiple fractures of lumbar spines.	No operation.	D	Fracture dislocation of third lumbar vertebra. The only intra-abdominal injury was one small partial rupture of small intestine.
34	26 M	(*a*) 24/7/98 (*b*) 24/7/98 (*c*) 25/7/98	Thrown from van, both wheels passing over abdomen.	Admitted with fracture of pelvis.	,, ,,	D	Rupture of anterior wall of cæcum. Fractured pelvis.

D = death. R = recovery. * 7½ hours after injury. † From obstruction by button.

In some cases, too, it seems to have been responsible for death even after an early and satisfactory operation before the onset of peritonitis.

Rigidity.—This sign was almost as constant as pain, and usually the abdomen was rigid from the onset. There is no mention in any case of persistent local rigidity.

Of the remaining signs and symptoms none were as constant as the above three, and most commonly they indicated only the onset of peritonitis. Of these latter the steadily rising pulse-rate was the most characteristic, and since this is only a relatively late indication of rupture, while pain, shock, and rigidity of the abdomen may all be present without serious intra-abdominal damage, there is no escaping the conclusion that early diagnosis is almost impossible. The surgeon must be guided more by a general consideration of the clinical picture than by the presence or absence of any particular sign.

It is commonly believed that the normal area of liver dullness is to some extent impaired in intestinal rupture, certainly in a great many cases, if not in all; it is interesting to note, therefore, that in only three of the 34 patients was this the case. In many cases, it is true, no mention is made of its presence or absence, but probably in the majority of these it was absent. On the other hand, in several cases it is definitely mentioned that the liver dullness was normal, so that little or no reliance can be placed upon its absence. Although small quantities of gas must escape from the bowel immediately after its rupture, it is unlikely that there is ever sufficient gas present, in the small intestine at any rate, to alter appreciably the relation of the liver to the abdominal wall. Such small quantities of gas have occasionally been seen in an early X ray examination of the abdomen, appearing as a localised pneumo-peritoneum, and the possibility of demonstrating the presence of free air by this means should always be considered. It is a great pity that this valuable aid to early diagnosis is not more commonly invoked in every case of doubt.

Mortality.

Of the 34 cases recorded, 3 refused operation, leaving for consideration 31. Of this number 7 recovered and 24 died—a mortality of nearly 78 per cent. The successful cases are given in Table II.

That no case of rupture of the stomach or duodenum recovered is accounted for by the fact that injury to these structures was in each case complicated by some other severe laceration, usually intra-abdominal. Of the 15 cases of injury to the jejunum, one case refused operation, and of the remaining 14 five recovered. Of the 8 cases of rupture of the ileum, one also refused operation, and of the remaining seven 2 recovered. There does not appear to be, therefore, any great difference in the mortality of ruptures of the jejunum and ileum respectively, although it might have been supposed that the contents of the latter are usually more septic, and peritonitis therefore earlier in its appearance. In all the successful cases, with the exception of one where Murphy's button was used, it will be noticed that simple suture of the rupture was the only surgical procedure necessary. In the three cases where resection was undertaken the patient died. In only one case was enterostomy performed, and in this case also the patient died.

TABLE II.

Case No.	Situation of rupture.	Nature of operation.	When performed.
8	Duodeno-jejunal junction.	Suture of rupture. No drainage.	Not recorded.
13	Jejunum, 5 in. from commencement.	,, ,,	"Following day."
14	Jejunum, 18 in. from commencement.	Suture of rupture. Drainage.	15 hours after injury.
15	Jejunum, high up.	,, ,,	Not stated; at least 21 hours after injury.
16	Jejunum completely severed.	Murphy button anastomosis.	2¾ hours after injury.
25	Ileum, in 2 places.	Suture of each rupture and drainage.	Following day.
28	,, ,,	,, ,,	Not stated. 2 hours after admission.

Note.—By drainage is meant drainage of the peritoneal cavity.

In the successful cases the time factor, so highly significant in the perforation of a gastric or duodenal ulcer, does not appear to be of so great importance, for although in one case operation was undertaken within two and three-quarter hours of the injury, in one case it was delayed 15 hours, and in another at least 21 hours, while in a further two cases the abdomen was not explored until the following day. Regarding rupture of the small intestine as a whole, of a total of 26 cases the continuity of the bowel was completely severed in 9. Of these one refused operation and of the remainder only one recovered. Of the 17 cases in which the continuity of the bowel was only partially divided, one again refused operation, but of the remainder six recovered. It is clear, therefore, that the mortality of the second group is considerably less than that of the first, and since peritonitis does not seem to have been more marked in one than in the other, it is reasonable to assume that the shock associated with the more severe injury is very largely responsible for this disproportion.

The shock always associated with intestinal rupture, if at all severe, tends to become worse as time goes on, and offers almost insuperable difficulty in the treatment of these cases. In extreme cases the patient dies, even after an early and otherwise successful operation, while in its less severe degrees it obscures the whole clinical picture and masks the onset of peritonitis. A mortality of 78 per cent. is certainly enormous, and there can be little doubt that early exploration of the abdomen would reduce this to a considerable extent. At the same time, however, while every attempt in this direction should be made, it is doubtful whether in the present state of our knowledge a large percentage of recoveries can ever be attained.

I am much indebted to the members of the surgical staff of the hospital for their kind permission to publish these cases.

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A CASE OF COMPLETE DECEREBRATE RIGIDITY IN MAN,

WITH OBSERVATIONS ON VARIOUS REFLEX REACTIONS.

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In a recent paper[11] the writer discussed the question of Sherrington's decerebrate rigidity from the point of view of its occurrence and recognition in the human subject, and expressed the conclusion that while in the spasticity of hemiplegia and of the extended form of paraplegia we have a clear example of muscular hypertonus physiologically identical with that observed in the decerebrate animal, yet, so far, clinical neurological records contain no completely satisfactory account of a case of "decerebrate man." For the most part the cases to which this diagnosis has been attached during the past two years are examples of different varieties of extrapyramidal syndrome, or of tonic fits, none of which conditions can rightly be identified with Sherrington's decerebrate rigidity.

In these circumstances it may be of interest to place on record the following case, which is a closer approximation to the experimentally produced condition in question than any the writer has encountered in the human subject. Not only was the hypertonus physiologically identical with that described by Sherrington, but there were present Magnus and de Kleijn's tonic neck reflex and also a form of interaction between tonic and phasic reflexes, both of which are a normal accompaniment of the rigidity in animals. Further, the clinical picture was free from complication by those irregularities of respiratory and cardiac activity and by tonic fits, which are in all probability due to gross disturbances in the blood-supply of the brain stem, and are no part of true decerebrate rigidity.

The patient was an unmarried woman of 23. She was admitted to hospital complaining of blindness of sudden onset seven days previously. Up to the morning on which she awoke to find herself deprived of vision she had been at her usual work, but she stated that during the year preceding she had suffered from occasional "bilious attacks with headache," which she had not regarded seriously.

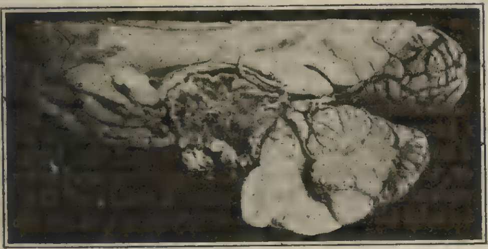
Condition on Examination.—The patient was alert, with normal intelligence, emotional tone, speech, development, and physique. There was total blindness in both eyes, no perception of light remaining in either; the discs showed intense papillœdema with commencing secondary atrophy, and the pupils were dilated and inactive, the cranial nerves being otherwise normal. The motor and sensory systems were normal. The tendon-jerks were brisk and equal on the two sides, the abdominal reflexes sluggish on both sides, and there was a bilateral extensor plantar response.

Operation.—A right-sided temporal decompression was performed, revealing a great increase of intracranial tension, but no other abnormality. A week later she was noted to have a well-marked left hemiplegia, with commencing flexor spasticity in the arm. There was considerable bulging of the scalp over the bone defect.

Course of Case.—During the second week after operation she gradually lapsed into a state of semi-coma, in which she could neither answer questions nor carry out simple orders. However, there was ample motor response of the right limbs to such stimuli as pinching or pin-prick. She remained thus for about two weeks, towards the end of which a right hemiplegia began to develop. Finally, in the fourth week complete double hemiplegia obtained. The patient lay motionless in bed. She was unable to swallow and was nourished by means of œsophageal feeds. The temperature was consistently below normal, ranging from 96° F. in the morning to 97° in the evening. The pulse was regular in force and frequency and averaged 84 per minute. Respiration was regular and unembarrassed and of a rhythm of 18. The blood pressure ranged between 130 and 140 mm. of mercury. During the last week of life the coma deepened, the tonic reflexes to be described failed, the rigidity waned, the tendon-jerks disappeared, and tonic fits, cardiac and respiratory irregularities developed. The blood pressure slowly sank during the terminal stage.

Post-mortem Examination.—A nodular mass was revealed, presenting at the base of the brain in the inter-peduncular space, and stretching and separating the optic tracts. It was strictly median in position, and on its under-surface and continuous with it was the pituitary body, which was of normal size. Median sagittal section of the brain exposed the tumour, as depicted in Fig. 1. The pituitary body was cystic and the large cavity contained in it was continuous with a large cavity in the lower portion of the growth. The tumour was sharply marked off from the brain tissue, and a fine membrane surrounded it as it filled the third ventricle. It was lobulated in structure and contained numerous small cystic cavities and calcareous masses. It clearly belonged to the well-defined group of supra-pituitary tumours recently discussed by Greenfield, Armstrong,[4] [5] and others. Histologically, also, it conformed to the description given by these authors, In addition, there was marked dilatation of the lateral ventricles. It seems probable that an acute secondary hydrocephalus was the cause of the rapid onset of symptoms in the first place, and that finally this and the pressure of a large mass in the middle line produced the effect of "decerebration" by compressing the structures in the anterior part of the brain stem and by cutting off the cerebral hemispheres from functional connexion with lower levels. The thoracic, abdominal, and pelvic viscera were all normal.

FIG. 1.



Sagittal section of the brain, the mesial aspect of the left half presenting, and revealing a supra-pituitary tumour which fills the third ventricle. The cystic pituitary can be seen at its lowest part. Histologically, the growth is a myxo-endothelioma.

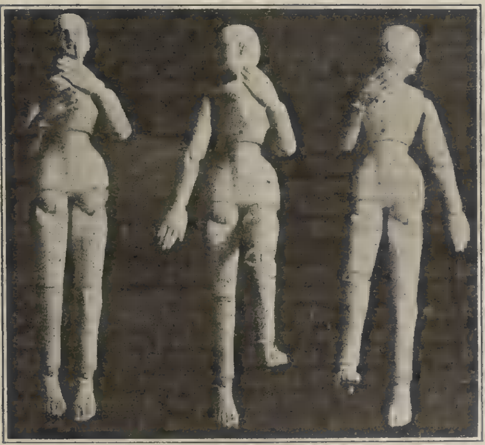
We may now pass to consider the features which led to the conclusion that the patient was a true example of decerebrate rigidity. The course of the illness may be divided into two stages for this purpose: (*a*) the stage of decerebrate rigidity, and (*b*) the stage of failing reflex activity and of tonic fits.

(*a*) *Stage of Decerebrate Rigidity.*

The patient lay motionless and unconscious on her back, with the head in the median position. There was no trace of head retraction. The arms lay across the chest, semi-flexed at the elbows, with the forearms slightly pronated and the wrists and digits flexed. The legs lay extended and adducted with the feet plantar-flexed. There was spasticity of moderate degree in all four limbs, definitely more pronounced in the arms than in the legs. In the former the flexors were concerned, in the legs the extensors (and plantar flexors). In addition to this characteristic selective incidence, the hypertonus showed all the usual features of decerebrate rigidity. Owing to its recent onset, it was extremely plastic, the limbs tending to retain any new posture passively imposed upon them. Nevertheless, on returning to the patient after the lapse of about ten minutes, they were invariably found to have resumed the initial positions above described. Passive stretching of a spastic muscle, the flexors of the forearm or the knee extensors, revealed the familiar "clasp knife" character of the spasticity and experimentally produced decerebrate rigidity, in which after the initial tonic resistance has been overcome the spasm seems suddenly to melt away.[6] [9] The tendon-jerks were all very brisk and presented the tonic prolongation typical of the "spastic" tendon-jerk. In the case of both knee- and supinator-jerks the "step-ladder" shortening of the muscle after each of a series of rhythmically elicited jerks was observed.[11] In short, all the features of decerebrate rigidity were present. The abdominal reflexes were absent, and stimulation of the sole was followed by a flexion reflex consisting of an ample Babinski plantar response, and of a rapid, short-lived flexion at hip and knee of moderate amplitude. Simultaneously, the foot and great toe of the crossed limb plantar-flexed (crossed extension reflex).[8]

Tonic Neck Reflex of Magnus and de Kleijn.—The method of eliciting this reflex and its characters in the human subject I have already described in detail elsewhere.[10] They were very facile in this subject, and obeyed the laws formulated by Magnus and de Kleijn.[5] Two assistants supported the lower limbs above the bed in an attitude of slight flexion at hip and knee, the two arms were slung from the wrist so as to lie just free of the trunk. In these circumstances the observer took the head between his two hands and rotated it to right or to left as desired. The following tonic reactions were observed. When the head was rotated so that the face looked over the right shoulder, the right arm, after a latent period of about two seconds, slowly extended at the elbow, the whole limb abducted, the forearm went into increased pronation. The wrist and digits remained immobile. The right lower limb slowly and actively extended, the foot plantar-flexing. *The left arm* (that on the side to which the occiput was directed) simultaneously went into full flexion at the elbow so that the hand came into the neighbourhood of the neck, the forearm supinated, and the wrist and digits remained immobile. The left leg moved very slightly into an attitude of increased flexion at hip and knee and the foot moved up slightly into dorsiflexion. The limbs retained these new attitudes as long as the head remained with the face looking to the right, but as soon as it was again rotated so that the face came to look over the left shoulder the relative attitudes of the right and left limbs were reversed. Slowly the right arm and leg took up a posture of flexion, while the left arm and leg slowly extended, taking up an attitude like that previously held by the right limbs. When the leg was allowed to lie extended on the bed the foot on the side towards which the face looked went into full plantar flexion. These attitudes and their relation to the position of the head are illustrated in Fig. 2 by photographs of a lay figure.

FIG. 2.



Photographs of a lay figure representing the attitude of the patient's limbs in the three positions of the head—in centre, turned to right, and turned to left. Actually, the patient's wrists and digits were flexed.

Interaction of Tonic Neck Reflex and of Flexion Reflex of Lower Limb.—Sherrington[7] has shown that tonic or postural reflexes are very readily overset by phasic reflexes—that is, by reflex movements of nociceptive character, but that the initial posture of the reacting limb is at once restored by an active return of the tonic reflex originally in possession of the musculature. Thus the extensor rigidity of the hind limb is temporarily inhibited by the flexion reflex, but as soon as active flexion ceased the limb returns to extension by an active "extensor rebound." Further, following the momentary inhibition, extensor tone may be increased in intensity ("post-inhibitory exaltation"). Clearly the force of the rebound and the degree of exaltation will depend upon the intensity of extensor tone originally present, and under different grades of extensor tone the flexion reflex may be expected to show different characters in respect of amplitude and time relations. This is simply an expression of that interaction of tonic and phasic reflex which is a normal element in coördination. Now, in Magnus and de Kleijn's tonic neck reflex we have a method of varying the degree of extensor hypertonus at will from moment to moment, and therefore the form of the flexion reflex may be modified by head rotation. Indeed, Graham Brown[3] has found that in the decerebrate animal the active modification of the posture of the reacting limb may cause a complete reversal of the form of a reflex movement ("reflex reversal"). The present subject afforded an excellent opportunity of investigating this point, and since, as is now widely accepted, the Babinski plantar response is simply the dorsiflexion component of the flexion reflex of the lower limb of man, it may be used as an index of modifications in the flexion reflex.[12]

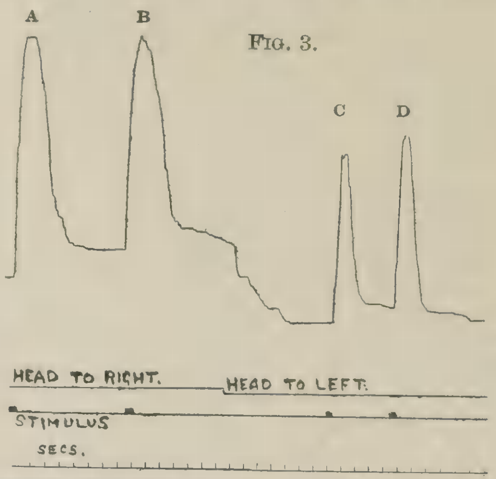


FIG. 3.

Graphic records of four successive Babinski responses elicited from the left sole; A and B were elicited with the head turned to the right—i.e., with face looking to right; C and D with head turned to the left. Upward movement = dorsiflexion, downward movement = plantar flexion. Sole stimulation, head rotation, and time are recorded below. It can be seen that spontaneous plantar flexion of the foot and hallux followed rotation of the head to the left, and that the two responses obtained with the head in this position are less ample and of shorter duration than the first two, which were obtained with the head turned to the right—i.e., with minimal extensor hypertonus in the limb.

Accordingly the present subject showed a marked change in the plantar response when the head was rotated from one lateral position to the other. Thus when the head was rotated so that the face pointed to the right shoulder, stimulation of the left sole evoked an ample Babinski plantar response with dorsiflexion of the foot and some flexion at hip and knee. The return or extension (plantar flexion) phase of the response was slower than the active flexion (dorsiflexion) phase and was incomplete. If the head was then rotated so that the face pointed to the left shoulder, the foot plantar flexed. The plantar responses subsequently elicited were less ample than those just described and the return, or extension phase, was rapid and complete. In these circumstances the extensor spasticity of the limb was maximal, and "extensor rebound" cut short the flexion reflex and rapidly restored the initial posture of the limb. Similar examples of this phenomenon have been described by the writer elsewhere, and apart from their obvious practical interest they have a great theoretical importance. These variations in the plantar response are graphically recorded in Fig. 3.

(*b*) *State of Failing Reflex Activity and of Tonic Fits.*

During the last five or six days of the patient's life the condition we have described gave place gradually to a progressive failure of reflex activity and to deepening coma. The temperature began to swing from 96° in the morning to 101° in the evening. The pulse and respiration rates became rapid and variable. The blood pressure sank below 100. The Magnus and de Kleijn reflexes failed completely five days before death and the rigidity waned, but never entirely disappeared in the arms, which retained the posture described. The tendon-jerks disappeared and the flexion reflex on stimulation of the soles diminished in amplitude and force. Twice during the last days of the stage we have described as that of decerebrate rigidity the patient was noticed suddenly to become extremely rigid in her customary posture, and to become very red in the face. These attacks were of momentary duration. During the last week, however, they became of great frequency and intensity. The respiratory muscles became fixed, and the limbs were so rigid that no tendon reflexes could be elicited. These attacks lasted for from 15 to 20 seconds and passed off as suddenly as they developed, the patient sinking down into the bed. In the more severe ones the head retracted forcibly. A very large number of these tonic fits were noted, and doubtless many more escaped observation. They ceased entirely during the last 24 hours of life, when the patient was obviously moribund.

Comments on the Case History.

A close examination of this case history reveals but two points of defect from the complete picture of decerebrate rigidity as seen in the experimental animal. The first of these is the flexion posture of the upper limbs, the second the retention of temperature control. In earlier papers[9] the possible explanation of the flexed position of the upper limbs in hemiplegia has been discussed. It may be traced to the fact that in man the forelimbs are no longer simple locomotor props and have taken on new and highly complex functions under the influence of the cerebral cortex. In consequence we should not expect them to take up the extensor attitude of standing. Secondly, the animal after transection of the brain stem in the region of pons or medulla loses all temperature control, and, as Bazett and Penfield have shown,[2] this fact is the chief obstacle to keeping the decerebrate preparation alive for more than a few hours. It is clear, therefore, that our patient was not completely "decerebrate," and that to this fact we owe our opportunity of observing over so long a period a clinical picture identical in every other essential with experimentally produced decerebrate rigidity.

With the various theoretical considerations arising out of the presence of Magnus and de Kleijn's tonic reflexes, and of the interaction between these and the flexion reflex of the lower limb, it is not proposed to deal here, for they are discussed fully elsewhere.[10, 12] Tonic labyrinthine reflexes were not sought for, since the handling of the patient which their investigation involves was not thought desirable.

A few observations on the stage of failing reflex activity may be made. It is noteworthy that it was at this stage, when the phenomenon of decerebrate rigidity was finally disappearing, that tonic fits and the respiratory and cardiac irregularities which always accompany them made their appearance. It would be difficult to find a more striking demonstration of the fundamental difference between tonic fits and true reflex decerebrate rigidity than this sequence of events provides. Lastly, a comparison of the condition observed in this patient during the stage of decerebrate rigidity with the types of muscular spasm seen in the extra-pyramidal syndromes should, if our identification of it be correct, finally dispose of the view now widely current that Parkinsonian rigidity, chorea, and athetosis can in any way be correlated with this clearly defined group of reflex phenomena.

(*Continued at foot of next column.*)

THE RELATION BETWEEN THE GROWTH-PROMOTING AND ANTI-RACHITIC FUNCTIONS OF CERTAIN SUBSTANCES.

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THE study of the vitamins during the last few years has thrown a new light on the cause of the general therapeutic value of cod-liver oil. Soon after the description of the fat-soluble A food factor by McCollum and Davis,[1] Osborne and Mendel[2] showed that cod-liver oil contains this principle. Mellanby[3] demonstrated the anti-rachitic function of some food-substances containing fat-soluble A. Zilva and Miura[4] were able to prove that cod-liver oil contains it in great abundance, namely, about 200 times as much as butter, which fact, in their opinion, was responsible also for the disparity in the therapeutic action of the two substances, especially in the prevention and cure of rickets. Soon after, McCollum, Simmonds, Shipley and Park[5] brought forward experimental evidence that the calcium depositing property of cod-liver oil was much greater than that of butter, and they advanced a theory that the calcium depositing or anti-rachitic factor and the fat-soluble A factor were not one and the same principle. It was pointed out at the time by one of us (S. S. Z.)[6] that these investigators were not taking sufficiently into consideration the great difference in the fat-soluble vitamin content of cod-liver oil and butter, and that the disparity in the anti-rachitic functions of the two substances could be equally explained by that fact. Recently many researches have shown that light can aid the promotion of growth as well as induce the deposition of calcium in bone. This parallelism also pointed to the existence of one principle. McCollum, Simmonds, Shipley and Park[7, 8] have since produced further evidence in support of their hypothesis. Striking as their evidence was, it was considered that their results would have been more convincing if stricter quantitative methods had been employed, and if the growth-promoting property of the substances had been taken as a criterion of the fat-soluble A factor instead of the anti-xerophthalmic property, which, in our opinion, is not so suitable for comparative work, because it is a less constant manifestation in rats subsisting on a fat-soluble A deficient diet. However, the results recorded below tend to confirm the hypothesis of McCollum and his collaborators that the two principles are not the same, their destruction by heat and oxidation and their quantitative distribution being different.

Experimental.

In the experiments an attempt was made: (i.) To ascertain whether the inactivation of the growth-promoting and anti-rachitic functions by heat in the presence of air proceeded at the same rate. For this purpose cod-liver oil was investigated. (ii.) To determine the quantitative distribution of the alleged two factors. For this a substance very different in character from cod-liver oil, such as spinach, was employed.

1. *Inactivation of the Growth-promoting and Anti-rachitic Functions of Cod-liver Oil by Heat and Aeration.*—In this experiment about a litre of cod-liver oil of known growth-promoting and anti-rachitic properties was heated in an oil-bath at a constant temperature of 120° C., whilst a continuous current of air was aspirated through it. Portions of the cod-liver oil were removed 6, 12, 18, and 24 hours after it had reached 120° C., and in these samples the growth-promoting and anti-rachitic properties were estimated. For the estimation of the fat-soluble growth-promoting factor the quantitative method of Zilva and Miura[4] was employed. The fat-soluble deficient diet used consisted of:—

Inactivated casein ..	20 g.	Decitrated lemon-juice	5 c.cm.
Starch	50 „	Marmite	5 g.
Cotton-seed oil	15 „	Distilled water ..	50 c.cm.
Salt-mixture*	5 „		

* McCollum,[9] No. 185.

In the investigation of the anti-rachitic property of the oils and other substances it was decided to study the preventive rather than the curative action. McCollum and collaborators based their conclusions upon a study of the curative property of the substances they investigated, and recommend it as the best method. Both methods were tried, but the preventive one was considered the more suitable for quantitive work and easier to standardise. Using macroscopical and microscopical appearance as well as calcium content of the bones as the criteria upon which to base a diagnosis, it was found, in a quantitative study such as this, to be the more reliable method upon which to base conclusions.

The rickets-producing diet employed was No. 3143 of McCollum and collaborators, which is constituted as follows:—

Diet No. 3143.

Wheat	33 g.	Sodium chloride ..	1·5 g.
Maize	33 „	Calcium carbonate ..	3·0 g.
Gluten	15 „	Distilled water† ..	60·0 c.cm.
Gelatin	15 „		

† Added to make a paste.

This diet is deficient in phosphorus and the fat-soluble organic factor. In another study by one of the authors (H. G.) about 150 rats, similar in origin and age to those employed in this investigation, were kept on the above diet, and, without a single exception, they developed severe rickets in four weeks. Four weeks, therefore, was adopted as the standard experimental period. Since the diet employed is low both in phosphorus and anti-rachitic factor, absolute normality of the bones could not be expected as a result of the addition to it of the organic factor only. However, in preliminary trials it was found that the administration daily of an adequate amount of cod-liver oil to rats on this diet had a profound effect on the development and calcification of their bones. Though they were not absolutely normal, yet neither grossly nor histologically did they show any resemblance to rickets. Although the rickets-producing diet employed was of different composition from the fat-soluble A deficient one used in the tests for growth-promotion, it is to be pointed out that the conclusions are based only upon the relative *rate* at which each function is destroyed by heat and oxidation, and not upon the relative *quantity* of each factor contained in the various substances.

(*Continued from previous column.*)

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Table I. gives a comparative description of a typical rat kept on diet 3143 for four weeks, and of one on the same diet plus a daily minimal protective dose (3·3 mg.) of cod-liver oil. The most definite and most reliable criterion for the final diagnosis was the histology, but the gross appearance and chemical analysis of the bones were of material aid in deciding the end-point in the titration of the substances. The microscopical investigation often demonstrated pathology not recognisable macroscopically, so that what appeared doubtfully positive protection in the gross always turned out definitely negative upon histological examination.

TABLE I.

Control rats on diet 3143 for four weeks. Severe rickets.	Rats on diet 3143 for four weeks that received daily a minimal protective dose of cod-liver oil. No rickets.
Macroscopical.	
1. Deformed chest.	1. Chest full and rounded.
2. Enlarged costo-chondral junctions and epiphyses.	2. No enlargement of costo-chondral junctions or epiphyses.
3. Very indistinct, disorganised costo-chondral line.	3. Costo-chondral lines straight and distinct.
4. Fractures of bony portion of ribs.	4. No fractures.
5. Bones very pliable.	5. Bones very much firmer than those of control, but more brittle than normal.
Microscopical.	
1. Deformity of rib near costo-chondral junction.	1. No deformity.
2. Very great proliferation of zone of provisional calcification. (25–50 layers of hypertrophic cartilage cells.)	2. Zone of provisional calcification consisting of 3–7 layers of hypertrophic cartilage cells.
3. No calcium deposit in zone of provisional calcification.	3. Moderate to very good deposit of calcium in zone of provisional calcification.
4. Disorganisation of zone of provisional calcification.	4. No disorganisation of zone of provisional calcification.
5. Wide rachitic metaphysis consisting mainly of osteoid and of uncalcified cartilage.	5. No rachitic metaphysis. Trabeculæ thin and short, but straight and well calcified.
6. Very great increase of endosteal and periosteal osteoid of cortex.	6. Only the physiological amount of cortical osteoid.
7. Callus of fracture consisting mainly of osteoid, uncalcified cartilage, and fibrous bone-marrow.	7. No fracture.
Calcium Content of Bones.	
Average % wet, 4·39. Average % dry, 11·43.	Average % wet, 6·77. Average % dry, 14·81.

Including the number used for the preliminary tests 208 rats were used in this part of the investigation. For economy of space the protocols of the rats will not be included in this report. The rats were put on the rickets-producing diet at the age of from 25 to 28 days and weighing about 40 g. Two sets of controls were used in the titration of every oil: one set receiving the rickets-producing diet alone, the other the same diet supplemented by a daily dose of the crude oil known to protect against the development of rickets. The first titration of the potency of an oil was made by using quantities within wide limits—viz., 2·25 mg., 22·5 mg., and 225·0 mg. daily. If one of these doses gave protection, then the final value was determined by titrating with quantities at close intervals between the first positive result and the negative one immediately below it. In the case of the growth-promoting experiments four animals were employed for every dose, and the minimal quantity was arrived at by a similar spacing of doses.

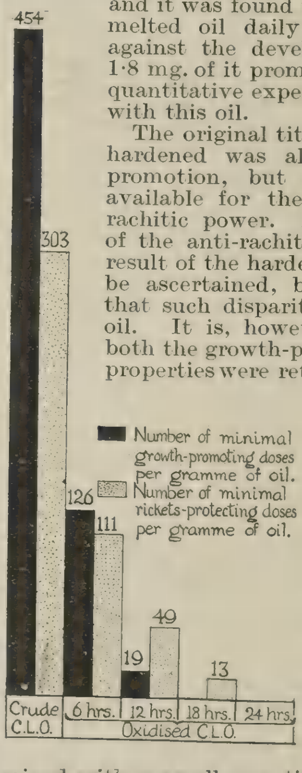
The final values given in Table II. for the minimal anti-rachitic and growth-promoting doses of the various oils represent in every case the mean between the first definitely positive result in the final titration and the negative one immediately below it, both of which are also given in the table.

The chart compares the potency of the above oils by giving the number of minimal growth-promoting and rickets-protecting doses per gramme of every oil. It shows very well that although the initial potency of the crude oil was somewhat greater for growth-promotion than for protection against rickets, yet the growth-promoting function suffered more rapidly from oxidation at 120° C. than did the anti-rachitic function. In the specimen removed after 18 hours of heating and aeration the growth-promoting function was practically destroyed, while the anti-rachitic power was still retained in a moderate degree. In the 24-hour specimen of oxidised cod-liver oil neither function could be detected.

TABLE II.

Type of oil.	Anti-rachitic function.			Growth-promoting function.		
	Dose which just failed to protect.	Dose which gave definite protection.	Calculated minimal protective dose.	Dose which just failed to promote growth.	Dose which promoted definite growth.	Calculated minimal growth-promoting dose.
	Mg.	Mg.	Mg.	Mg.	Mg.	Mg.
Crude cod-liver oil	2·2	4·5	3·3	1·9	2·5	2·2
or Oxidised cod-liver oil—						
6 hours	6·7	11·2	9·0	6·7	9·0	7·9
12 „	18·0	22·5	20·2	45·0	56·2	50·6
18 „	67·5	90·0	78·7	450·0*	—	—
24 „	450·0*	—	—	1000·0*	—	—

* Indicates that this dose definitely failed, and that a larger dose was not tested.



For additional information a sample of hardened cod-liver oil was also tested for the two functions, and it was found that about 33·7 mg. of the melted oil daily were potent to protect against the development of rickets, while 1·8 mg. of it promoted growth. An elaborate quantitative experiment was not performed with this oil.

The original titre of the oil before it was hardened was also 1·8 mg. for growth-promotion, but no specimen of it was available for the estimation of the anti-rachitic power. How much deterioration of the anti-rachitic potency occurred as a result of the hardening could not, therefore, be ascertained, but it is hardly possible that such disparity existed in the original oil. It is, however, very significant that both the growth-promoting and anti-rachitic properties were retained in a high degree by the hardened oil.

2. *The Growth-Promoting and Anti-rachitic Functions in Spinach.*—Spinach was used as the plant source of the organic factor. The fresh leaves were ground to a paste and administered in quantities from 0·1 g. to 3·0 g. daily to rats that had stopped growing on the fat-soluble deficient diet and to rats on the rickets-producing diet No. 3143. The daily dose of spinach was mixed with a small quantity of the diet and served first. When that was consumed the rat was allowed to have the rest of the ration. The minimal growth-promoting dose was found to be between 0·1 and 0·25 g., while even 3·0 g. daily, the maximum dose which it was found practicable to administer (about 30 per cent. of the diet), did not have the slightest effect in

promoting calcium deposition. The animals that received the spinach were as severely rachitic as the controls. This result is similar to that of McClendon,[10] who found that from 0·1 to 0·5 g. of dried spinach cured ophthalmia, while it showed no evidence of affording protection against the development of rickets even when it formed as much as 75 per cent. of the daily diet. Zucker [11] also showed that an alcoholic and ether extract of spinach, while it possessed the power to promote growth, was unable to protect against the development of rickets.

Summary.

1. The growth-promoting and anti-rachitic properties of cod-liver oil are inactivated at different rates by heat in the presence of air.

2. There is a very great disparity between the growth-promoting and the anti-rachitic potency of spinach.

3. A certain sample of hardened cod-liver oil has been found to possess high growth-promoting and anti-rachitic activity.

4. The above observations give further support to the hypothesis of McCollum, Simmonds, Shipley, and Park that the anti-rachitic and the fat-soluble A factors are different principles.

To Prof. C. J. Martin we give our sincere thanks for very helpful advice and criticism during this investigation. A part of the expenses of this research was defrayed from a grant made by the Medical Research Council, to whom our thanks are also due.

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PRENATAL CARE AND PUERPERAL MORTALITY.*

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THE remarkable fact that there has been no appreciable reduction in the maternal mortality of childbirth during the last 50 years is capable of two possible explanations: either obstetric medicine has made no progress or the modern advances are not in general use. The first suggestion is obviously untrue, for no one can doubt that valuable additions have been made to the treatment of the disorders and complications of pregnancy and the conduct of difficult labour, and it can easily be shown that these advances are competent to reduce the puerperal mortality if and when they are properly employed. But it has not yet been realised that modern methods are essentially preventive methods, and that to be successful they must be initiated during the prenatal period. Thus, the early prophylaxis of the toxæmias, contracted pelvis, and puerperal sepsis gives almost uniformly good results, whereas the latter continue to be disappointing if treatment is delayed until the disease or mechanical difficulty has reached an advanced stage.

But it is absurd to argue that modern methods have failed because the mortality is still high in cases of convulsive eclampsia, ruptured uterus, or puerperal septicæmia; on the contrary, such dangerous complications are almost impossible if prenatal care is exercised, and therefore the development of such advanced lesions is per se strongly suggestive of the neglect of modern methods. Some degree of failure to recognise and treat warning prodromata is inevitable so long as midwives continue to supervise from 50 to 75 per cent. of all pregnancies, and while the general public remain indifferent, if not hostile, to routine prenatal work; but the very inadequate training of medical students and the exigencies and established usages of general practice are also responsible factors.

As a direct consequence the general practitioner is commonly compelled to undertake the treatment of obstetric difficulties in emergency without adequate assistance and often under grossly unsuitable conditions; or the case is admitted to hospital after unsuccessful interference at home, sometimes in extremis, or at least under circumstances highly "suspect" and dangerous, and which, in spite of the resources of hospital technique and equipment, may completely discount the value of otherwise safe and effective treatment.

Attention has already been drawn to the subject in a report on Maternal Mortality published by the Local Government Board in 1915. After an exhaustive inquiry the following conclusions were expressed:—

> (1) The majority of deaths are caused by puerperal fever, hæmorrhage, and convulsions, most cases of which are well within the range of preventive medicine.
>
> (2) Local differences in total mortality are in the main caused by differences in availability of skilled assistance when needed during pregnancy and at and after childbirth.
>
> (3) Puerperal fever has been substantially eliminated from lying-in hospitals, but otherwise there is a remarkable uniformity in its distribution.

Papers on this subject have usually been written from the hospital standpoint, and fail to recognise, and therefore neglect, the totally different and much more difficult conditions of general practice. Many suggested remedies are impracticable because they cannot be applied to the majority of cases. Admittedly it is impossible to produce uniformity of skill and technique, just as it is unnecessary to provide so-called surgical surroundings for ordinary uncomplicated labour; but it is neither unreasonable nor impracticable to demand that abnormal pregnancy and complicated labour should be diagnosed as quickly and treated as carefully as other major surgical emergencies. Prenatal care is the only method of attaining this object, and fortunately a simple one, for its elementary principles are not beyond the powers of the average midwife, and its teaching can be applied as easily in general as in hospital practice; and not until this method is universally adopted can any serious reduction of the puerperal mortality be effected. To support this contention it is necessary to demonstrate three groups of facts: (1) the causes of death in childbirth; (2) the extent to which these morbid processes are associated with recognisable warning symptoms during pregnancy; (3) the proof that such prodromata are largely amenable to preventive treatment.

Causes of Maternal Death in Childbirth.

At Brownlow Hill Infirmary, Liverpool, since 1880 there have been 159 deaths amongst 14,000 cases delivered in the maternity wards. The causes of death were generally determined by autopsy, and may be classified as follows:—

Puerperal Sepsis (53).—Septicæmia, 18; septicæmia and syphilis, 6; septicæmia and gonorrhœa, 1; peritonitis, 16; septic pneumonia, 5; erysipelas, 2; cellulitis, 1; phlebitis, 1; salpingitis, 2; pyelitis, 1. (*a*) Most of these labours were instrumental or otherwise complicated. (*b*) Patients belonged to the lower strata of society and showed a high incidence of venereal infection. (*c*) Modern control of sepsis in hospital is shown by the following figures : 1880–90, 30 deaths ; 1890–1900, 13 deaths ; 1900–10, 7 deaths ; 1910–20, 3 deaths. (*d*) The many different types of fatal sepsis shown emphasises the importance of honesty in diagnosis and suggests that if accurate notification became general the amount of puerperal infection would exceed the high figures now apparent.

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* A paper read before the Liverpool Medical Institution.

Hæmorrhages and Accidents (26).—Post-partum hæmorrhage, 8 ; post-partum hæmorrhage and sepsis, 4 ; ante-partum hæmorrhage, 4 ; placenta prævia, 4 ; ruptured uterus, 5 ; craniotomy (shock), 1.

Toxæmias (17).—Jaundice, 1 ; albuminuria (nephritis), 2 ; eclampsia, 14.

Intercurrent or Pre-existing Organic Disease (63).—Pneumonia, 12 ; bronchitis, 11 ; phthisis, 17 ; heart disease, 9 ; typhoid fever, 3 ; meningitis, 2 ; cerebral abscess (latent before delivery), 1 ; cerebral tumour, 1 ; insanity (hunger strike), 1 ; scarlet fever, 1 ; irritant poison and alcoholism (coroner's inquests), 1 each ; carcinoma of cervix, 1 ; cancer of liver, 1 ; tuberculosis of kidney, 1. In a few of these cases pregnancy played a small and insignificant part in producing the fatal result : in a larger number parturition was the dominant factor and the essential cause of death. It is clear that the association of conception and independent organic disease may lead to the formation of a vicious circle of a most dangerous type, and that all such cases require early and vigorous prenatal treatment.

At the Liverpool Maternity Hospital in four recent years there have been 63 deaths amongst 2934 consecutive cases, of which 1239 were complicated.

Hæmorrhages and Accidents (26).—Accidental hæmorrhage, 13 ; placenta prævia, 4 ; post-partum hæmorrhage, 1 ; craniotomy (shock), 1 ; ruptured uterus, 5 ; incarcerated retroverted gravid uterus, 2.

Toxæmias (24).—Eclampsia, 21 ; toxic vomiting, 3.

Intercurrent or Pre-existing Disease (10).—Heart disease, 5 ; pneumonia, 3 ; embolism, 1 ; appendicitis, 1.

Sepsis (3).—Pyelitis, 1 ; peritonitis following Cæsarean section, 1 ; septicæmia (associated with a septic prolapsed uterus), 1. Note that during this period of four years 88 deaths were notified in the city of Liverpool as due to puerperal fever, and that very few of them occurred amongst patients delivered in hospital—i.e., the majority occurred amongst women delivered in their own homes.

Puerperal deaths therefore fall into four groups : (1) Sepsis, commonest among women delivered at home. (2) Hæmorrhages and accidents, commonest in maternity hospitals. (3) Toxæmias, commonest in maternity hospitals. (4) Intercurrent or pre-existing organic disease, commonest in Poor-law hospitals.

Amount of Prenatal Care received by 60 Fatal Cases at the Liverpool Maternity Hospital.

A brief reference to this series will not only disclose the extent to which preventive measures were employed (or neglected) in these particular cases, but will serve as a rough standard of the present development of prenatal practice.

Toxæmias.—Eclampsia : All the 21 fatal eclamptics were brought into hospital after the onset of convulsions : five only had any sort of preventive treatment. One attended the out-patient department but persistently refused to come into hospital, although pressed to do so. The second had symptoms for six weeks and called in her doctor five days before the fits commenced. The third had symptoms for two weeks and treatment at home for two days. The fourth attended the out-patient department, was admitted after delivery with post-partum eclampsia, and died four weeks later from septic endocarditis. The fifth was the only case to develop eclampsia whilst under treatment—at the rest home attached to the hospital—a fulminant type who died 19 hours after the first fit.

Sixteen patents had no preventive treatment whatever, they were admitted (on an average) 10½ hours after the first convulsion, and 15 women died within 12 hours of arrival. An analysis of 142 Liverpool cases of eclampsia presented to the British Congress of Obstetrics, 1921, showed that only 20 (less than 14 per cent.) had received any attention prior to the onset of convulsions.

Toxic Vomiting.—Three deaths ; all three fatal cases were ill for several weeks without seeking advice, and died two, three, and nine days respectively after admission to hospital.

Accidental Hæmorrhage.—Thirteen deaths. As two women died within two hours and eight women within four hours of admission, the previous history of many of these cases was incomplete ; but only one patient had been attending the out-patient department of the hospital before the onset of bleeding. In most cases, however, the onset of the fatal bleeding was sudden and without warning symptoms.

Placenta Prævia.—Four deaths. All these patients had warning bleedings which they ignored, and were admitted to hospital more than 24 hours after the onset.

Post-partum Hæmorrhage.—One death. This case is an extreme example of the widespread ignorance and indifference of the patients themselves. The woman was a 12-para, who, in spite of a series of hæmorrhages at former labours (A.P.H. once, P.P.H. twice, and adherent placenta three times), had neglected to engage a midwife, much less consult a doctor. Skilled assistance was not obtained until after delivery, and then only after the onset of alarming bleeding. She was moribund on admission to hospital and died 50 minutes later.

Accidents of Pregnancy and Labour.—Nine deaths. Craniotomy for dystocia : One case, dying on admission from shock and hæmorrhage, the result of the repeated and unsuccessful application of forceps to a patient with unsuspected deformity of the pelvis. Ruptured uterus : Four cases, none of them associated with toxæmia or previous Cæsarean section. All had occurred before admission, and were due to the traumatic rupture of healthy uterine muscle—the end-result of obstructed labour. There had been no preliminary or prenatal examination in any of these cases ; the warning signs were therefore unrecognised, and the adoption of modern methods was fatally postponed.

Incarceration of Retroverted Gravid Uterus.—Two deaths. On admission one patient gave a history of two weeks' severe dysuria, the other seven days' anuria. Neither had received any active treatment before arrival at hospital.

Intercurrent or Pre-existing Organic Disease.—Ten deaths : Heart disease, 5 (partial prenatal treatment in two cases, none in 3) ; pneumonia 3, embolism 1, appendicitis 1. (It cannot be claimed that prenatal care would have prevented the fatal result in the last five cases.)

It is not intended to suggest that puerperal mortality will completely disappear when the adoption of early treatment is general ; but there is no doubt that the majority of puerperal fatalities belong to the class of preventable diseases, and therefore the maintenance of the present high puerperal death-rate is primarily due to the neglect of the principles and practice of preventive medicine.

Scope of Preventive Methods in Abnormal Pregnancy and Difficult Labour.

Development of Toxæmia.—In four-fifths of all cases of eclampsia there are prodromal symptoms, either headache, œdema or albuminuria, which may be present for an indefinite period before convulsions appear ; the latter are frequently heralded by other warnings, notably abdominal pain, vomiting, and disturbances of vision. Occasionally there appear to be no danger signals—some patients feel well and have large (i.e., pathological) appetites—but even here a silent or symptomless albuminuria usually precedes the toxic storm. It is no exaggeration to say that persistent albuminuria is as significant in the pregnancy of a primipara as the association of muscular rigidity and abdominal pain in the diagnosis of peritoneal infection. After the development of convulsions the outlook is always serious, for not only has valuable time already been lost, but the disturbance entailed by transit to hospital has a very unfavourable effect on the prognosis of such cases. Sometimes massive cerebral hæmorrhage, which may be an early or even initial disaster whenever the threshold of the convulsive stage is reached, will at once destroy all hope of successful treatment. Although malignant types do occur, it can be stated with confidence that some warning is usually given and that if the urine of all primiparæ were examined regularly—if the albuminuria of pregnancy were a notifiable disease and the necessary hospital accommodation available—the convulsive or dangerous stage of eclampsia would become rare and the mortality negligible. When albuminuria is detected—contamination being eliminated—the patient must be kept under observation, because sudden fluctuations in the albumin content, changes in the blood pressure, diminution in the quantity of the urine or the appearance of abnormal constituents, such as acetone, &c.,

may call for intensive treatment and perhaps the termination of pregnancy. The opinion of the late Dr. J. W. Ballantyne—the acknowledged pioneer of prenatal research—was expressed in the following statement made at the British Congress of Obstetrics in 1922:—

> "Of 800 expectant mothers, albumin was found in 254 cases. All the patients save one received preventive treatment—the one who had no preventive treatment developed eclampsia. He almost implored her to stay in hospital, for her labour was due in a few days, and the distant and near danger signals were present. The woman obstinately determined to go home—and returned with eclampsia. She was the striking exception which, in his opinion, abundantly proved the rule—the rule being preventive measures prevent eclampsia."

Dr. Eden quotes Prof. Couvelaire as saying that eclampsia has almost disappeared at the Clinique Baudelocque, Paris, and that he attributes this to the fact that the midwives are compelled to carry out regular examinations of the urine.

Mechanical Accidents of Labour.—Most catastrophes such as ruptured uterus and obstructed labour are the result of malpresentation of the child or bony deformity of the mother; their shadow is plainly visible during pregnancy to all who study prenatal diagnosis, and their successful treatment is one of the greatest achievements of preventive medicine.

No pregnant woman, primipara or multipara, should be submitted to the risks of labour without a careful consideration of her pelvis in relation to the size, lie, and presentation of the child; such routine examination, which is comparatively simple, will differentiate all pregnant women into three groups: (1) Grossly abnormal, major degrees of pelvic contraction, uterine tumours, organic heart disease, severe albuminuria. (2) Doubtful, minor degrees of contraction, bad obstetric histories—e.g., stillbirths, ante- and post-partum hæmorrhages, &c. (3) Normal.

The first group clearly requires hospital treatment or the equivalent; the second demands special supervision during the later weeks of pregnancy; whilst the third (by far the largest group) may be left with safety to deliver themselves at home. Under such conditions dystocia will disappear, perforation and the use of the cranioclast will become rare and will only be carried out under surgical surroundings on dead babies or monsters, and the unjustifiable application of high forceps with its attendant morbidity and stillbirths will be replaced by induction of premature labour or formal and safe Cæsarean section.

Prodromata of Hæmorrhage. — Placenta prævia usually gives warnings (slight bleedings in the eighth month), occasionally, however, a solitary bleeding is rapidly fatal. The same may be said of accidental hæmorrhage if one excludes the concealed type, which is almost invariably acute in onset and but rarely associated with prodromata. The majority of these concealed bleedings are seen in multiparæ (82 per cent. of the late Gordon Ley's series), and are toxic in origin; 84 per cent. of cases are associated with albuminuria, but it has not yet been determined whether the appearance of albumin precedes the bleeding or is merely coincident with it. It is hoped that further research will reveal the source and nature of the toxin and facilitate the diagnosis of the initial stages of the disease. All that can be said at present is that the pale, flabby multipara of many pregnancies is a potential bleeder, and that the appearance of albumin is of special significance in such cases.

Intercurrent or Pre-existing Organic Disease.—The relationship of pregnancy to independent organic disease has not yet received the attention it deserves, although it is well known that the process of reproduction has a profound influence on many morbid states in which the pregnant uterus may become a serious menace to life. In heart disease, for example, pregnancy taxes the reserve power of the heart, labour entails a strain which may be immediately or more remotely fatal, and embolism or persistent cardiac debility may follow an apparently successful delivery. To many of these patients the pregnant uterus is not a physiological but a malignant tumour, and it is the object of preventive research to determine the circumstances in which it is advisable and advantageous (in effect, a live-saving measure) to terminate pregnancy and prevent future conception. Of the five cardiac deaths mentioned in this paper, four occurred in multiparæ with 3, 9, 10, and 15 previous pregnancies. It is not unreasonable to think that if Cæsarean section and sterilisation had been carried out during one of their former pregnancies, the lives of these women might have been greatly prolonged.

Prevention of Sepsis.—The anatomical surroundings of the birth canal make antisepsis difficult and asepsis impossible, and it has indeed been shown that organisms are present in the vagina and even uterus after normal labour and during an afebrile puerperium. As the deeper tissues and blood-stream are easily accessible through small lacerations or through the placental site, which always offers a large venous and lymphatic portal of entry, it is a matter for surprise that dangerous infection is not more common. The natural defences, which must be extraordinary, are quite adequate to deal with natural delivery in the absence of gross contamination, and it is well known that the born before arrival invariably does well if the labour is otherwise normal. Of 28 cases born before arrival at hospital recently it was noted that the clothes of all the patients were offensively dirty, and that no personal preparation of any kind (skin, bowels, &c.) had been made: Fourteen women were delivered on arrival at the receiving room before any cleansing was possible; seven children were born in the street (in two cases the mother separated the child herself and walked a considerable distance to the hospital); three births took place in the ambulance, three in taxicabs, and one in a cookshop. In spite of these septic external surroundings every one of these women did well and the puerperium was afebrile in each case.

These results indicate that if labour is terminated naturally and without interference the external surroundings are relatively unimportant and the chances of auto-infection remote. The possibility of auto-infection cannot be denied, for it appears to be the only explanation of certain cases, but apart from these rare exceptions, puerperal fever is the result of infection from without.

One simple vaginal examination, if carelessly performed (with or without gloves), may carry virulent organisms from the ano-perineal skin with disastrous results. Repeated examinations are always risky, however careful one may be, and the risk increases with the amount of interference, from the application of forceps and versions to the manual removal of adherent placentæ, which is perhaps the most dangerous operation in ordinary midwifery.

Examination during pregnancy and just before term is not only perfectly safe, but will reveal most cases in which interference is likely to be required, so that suitable preparations can be made at home or the patient transferred (before labour) to hospital. In either case obstetric operations can be carried out deliberately, with surgical technique, proper assistance and equipment, and consequently with a minimum of risk of infection. The practice of pre-natal care will undoubtedly reduce the incidence of puerperal infection by limiting the number of obstetric operations undertaken as emergencies in patients' own homes, for it is these emergency conditions which are chiefly responsible for the development of puerperal sepsis.

Conclusions.

1. The majority of maternal deaths in childbirth are preventable by modern prenatal methods.

2. The majority of pregnant women receive no prenatal examination, and are therefore deprived of the advantages of modern treatment.

THE DIATHERMY TREATMENT OF GONORRHŒA IN WOMEN.

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IT has long been recognised that the treatment of gonorrhœa in women is very difficult to carry out successfully, and that the results are far from satisfactory; the fact that the gonococcus can spread by the vagina to the uterus and Fallopian tubes, and produce a general infection, renders the disease more difficult to cure in the female than in the male. Metastatic gonorrhœa occurs equally in both male and female, but the infected parts in the female are so difficult of access that local treatment is, in the majority of metastatic cases, only palliative; consequently the infected joints, &c., are not so easily treated as in the male, where the local condition can be successfully dealt with.

The usual condition found on examining a female with acute gonorrhœa is that there is a discharge from the urethra and cervix, and that the latter is eroded to a greater or less extent. The discharge from both contains pus and gonococci. From the os uteri the discharge varies; at first purulent, it later tends to become muco-purulent and ropy. It is in this condition that one sees most of the cases, and in the subacute or chronic stages, when the detection of the gonococcus is very difficult. If an acute case, the treatment of the urethra by lavage with sounds and urethroscopic treatment to follow will usually clear up the condition, but at the cervix uteri the latter is very persistent; treatment with the various medicated packs and tampons apparently produces little result, and the condition goes on until the chronic stage is reached, this state of affairs occurring even in cases restricted to bed.

Limits of Temperature Favouring Growth of Gonococci.

The hopelessness of the condition generally, and the fact that we had treated some cases of gonorrhœal arthritis with marked success, made us reason that something might be done in the actual treatment of the local condition with diathermy. It appeared obvious that as heat kills the gonococcus easily in culture, it only requires sufficient heat to kill it in the tissues; as diathermy would produce heat to the necessary extent, the idea would be to heat the cervix to such a temperature as would destroy the germs without burning the cervix. Georges Luys states that in culture the gonococcus can grow between 32° and 38° C., and that six hours at 40° will kill it. Below 30° C. colonies show no growth and tend to die at 18° C. Auguste Lumière and Jean Chrevotier, however, showed by their experiments that the gonococcus was even more resistant to cold.

Experiments carried out at the Military Hospital, Rochester Row, demonstrated that half an hour at 104° F. (40° C.) is a lethal dose for the organism. There is much discrepancy in these results. From our observations in the treatment of gonorrhœa by diathermy we conclude that a minimum temperature of 104° F. is necessary, and if that temperature is not exceeded it must be maintained for about an hour. These conclusions were arrived at in the treatment of men, in which cases the intra-urethral temperature of both the anterior and posterior urethra was taken every five to ten minutes, and in cases in which gonococci disappeared and were cured the temperature of every part of the urethra was not on an average maintained at 104° F. for longer than one hour.

Much higher temperatures can be attained and maintained in the female organs, from the fundus of the uterus to the urethra and external genitals, than in the male urethra. Gonorrhœa is easier to treat by diathermy in the female than in the male on this account, when the disease is confined respectively to these parts.

Technique.

In order to follow the technique of the treatment it is necessary to understand the physical properties of diathermy, and to dissociate it entirely from conducted and radiated heat. The tissues are very bad conductors of heat; for this reason it would be impossible by conducted heat to maintain the temperature necessary to effect a cure in the submucous tissues which have been penetrated by gonococci without burning severely the superficial columnar epithelium. By diathermy the superficial and deep parts can be equally heated; for it is penetrating, it passes through and through from one electrode to another, and is therefore ideal for the purpose. The amount of heat generated and maintained in any part under treatment does not entirely depend on the amount of current used, but on several other factors, one of the most important being the vascularity of the part. The more vascular the part the quicker the heat is carried away. The part of the body between the diathermy electrodes may be compared to the furnace of a radiator system.

The tissues are raised in temperature, and the fluid passing through the heated tissues is constantly carrying away heat, thereby reducing the temperature between the electrodes, and raising the general temperature of the body. It will be realised that any technique that retards the flow of blood through the part treated will raise the temperature of the part; this may be done by pressure of the electrodes, or compression of the vessels above or below the electrodes. The size of the active electrode exerts a powerful effect on the local temperature.

The two electrodes used in the treatment are of different sizes, the larger being the indifferent, while the smaller is the active electrode; the smaller the active electrode the greater is the concentration of heat around it. By reduction of the size of the active electrode a stage is finally arrived at when coagulation of the tissues takes place around it. The diathermy then becomes surgical. (For physical qualities of the current see THE LANCET, 1922, ii., 1316.) We have made various alterations in the shape and measurements of the active electrode; a cylindrical electrode three-quarters of an inch long and one-eighth of an inch in diameter, with rounded end, will, we think, be found the most convenient active electrode to use when the disease is a gonorrhœal cervicitis and endometritis. The circular discs should vary in size; the largest size that can be introduced through the speculum should be used. The larger the active electrode the better control can be kept on the temperature of the cervix and uterus, and the less likelihood is there of burning the mucous membrane.

Treatment of Gonorrhœal Endometritis, &c.

Presuming the case to be one of gonorrhœal endometritis, cervicitis, and urethritis, the treatment is carried out in the following manner. The patient having already been douched and placed on the couch in the lithotomy position, the indifferent electrode measuring 20 × 10 cm. is wrapped in a thick pad saturated in hot saline solution, and fixed by means of a binder on the abdomen as near to the pubes as possible. The cervix, os uteri, and urethra are cleansed with swabs. As large a speculum as possible is now introduced; in multiparæ a Haig Fergusson has generally been used, but in nulliparæ a Cusco has been found convenient.

The active electrode is screwed on to the holder and passed down the speculum; the stem of the active electrode is introduced into the os uteri with care, and the circular disc is then pressed gently against the cervix. Before the current is applied the speculum is slightly withdrawn to avoid contact with the active electrode. No overlapping of the vaginal wall should take place, the circular disc of the active electrode being kept in view throughout the treatment. The current is gradually increased, the temperature which it is desired to maintain is 107° F. It is, unfortunately, impossible to lay down any hard-and-fast rule as to the amount of current to be used; this will depend on the factors already discussed. All that can be said as a guide is that the amount of current usually necessary will vary from ¾ to 1 ampère.

The sensation of heat felt by the patient is not a good guide, as from our experience of these cases the cervix is peculiarly insensitive to heat; a superficial burn may occur without the patient suffering any discomfort. The temperature of the os was taken before the treatment commenced and was found to be on the average 99·2° F. The temperature after treatment of five to ten minutes varied from 102° to 112° F., and the difficulty of getting a correct temperature during the operation became evident.

We have now designed a combined active electrode and thermometer, which it is expected will give a constant indication of the temperature of the heated part. It would be advisable for those without experience of this operation to take the intra-uterine temperature every five minutes. Although a superficial burn of the cervix heals readily, it must be borne in mind that future treatment is held in abeyance until the part is normal again. The ordinary clinical thermometer must register within half a minute, and must be introduced into the os very quickly if the correct rise is to be registered, as the part is so vascular that the temperature drops to normal very rapidly when the current is cut off.

Treatment of Gonorrhœal Urethritis.

To treat gonorrhœal urethritis the indifferent electrode is drawn well down to the pubes; after lavage and swabbing of the urethra an active electrode which consists of a cylindrical metal rod five-eighths of an inch in diameter and of convenient length is introduced to the extent of 2½ inches into the vagina and pressed in an upward direction against the vestibule and urethra. More current will be required than for the treatment of the cervix—usually about 1½ ampères is sufficient to maintain the intra-urethral temperature at 106° F. The treatment is given for ten minutes and repeated five or six times when a cure should be effected. Smears should be taken the day after each treatment. No diathermy electrode should be introduced into the urethra on any account; the necessary lethal temperature can be attained with ease without this expedient, and all chance of a burn of the urethra avoided.

As in the case of the urethra, the duration of treatment to the cervix and uterus should be for ten minutes, provided that the temperature is maintained throughout at an average of 107° F. The results of diathermy are marked; the cervical erosion heals rapidly, the discharge becomes less, and gonococci gradually disappear from the smears. With a continuation of treatment the muco-purulent ropy discharge disappears, and quite clear mucous secretion, without any gonococci in either smear or culture, is then left. Some of our cases were treated in hospital and others as out-patients; they did equally well. It is not necessary to admit cases unless they get burnt.

Diathermy Burns.

It may be necessary to explain that the burn which has been mentioned several times in the course of these observations differs entirely from an X ray burn, or the burn which originates from the electrode of a galvanic battery. The latter are sometimes most difficult to cure. Most surgeons are now familiar with the wound caused by surgical diathermy. The burn which has occurred in some of the cases is a very superficial surgical diathermy coagulation, and there has been no difficulty, in spite of the previous infection, in obtaining complete healing. We strongly advocate team work in this treatment. The technique of diathermy can only be acquired by long practice, while the selection of cases suitable for treatment, their observation, general treatment, and the verdict as to establishment of cure, are matters best dealt with by an expert in venereal diseases.

Reviews and Notices of Books.

THE MEDICAL PROFESSION IN INDIA.

By Major-General Sir PATRICK HEHIR, K.C.I.E., C.B., C.M.G., I.M.S. London: Henry Frowde and Hodder and Stoughton. 1923. Pp. 139. 7*s.* 6*d.*

Patrick Hehir began his medical study in the Calcutta Medical College and finished it in Edinburgh and at Guy's Hospital. He spent the greater part of his active life in India, filling every sort of medical appointment in military life and many in civil life, including lecturing on various subjects, health officer to a large municipality, general practitioner, and consulting physician. Since his right to speak with knowledge on the position of medicine in India is combined with discernment and a rare sense of values, his book will appeal to all who take an interest in the medical services of India or in the advancement of medicine in that great country.

The author regards the present situation as critical, for the Indian Medical Service has lost its attraction for young graduates of the home medical schools, while the deficiencies in Indian medical education have not yet been made good. The entire environment of the medical student in the United Kingdom is more salutary and invigorating than it is in the Indian colleges where the student is not taught from nursery days onwards how to make things for himself and where written examinations loom very large. While there are probably not more than a few dozen Indians with the qualifications necessary to fill professorial chairs, there were until lately hundreds of officers of the I.M.S. qualified to do so. For this reason no exception can be taken to Rule 12 of the Devolution Scheme under which the India Office has reserved 305 civil posts for officers of the I.M.S., 240 under local governments, and 65 directly under the Government of India. Medical education in India has its good points, but it is gravely behind in the ancillary subjects—pharmacology, physiology, bacteriology—and training in midwifery cannot be compared with that at home. There are no fever hospitals or hospitals for special regions, or for skin diseases, and, most surprising of all, there are no dental schools or hospitals whatever in the country.

This is the base of the position on which Sir Patrick Hehir writes his book. He gives a bird's-eye view of medical education in India, a business-like account of the Government medical services, and a description of the independent medical profession in India which is highly challenging. On the British basis of one doctor to every 1100 persons, some 250,000 independent practitioners could be utilised in India, whereas, when the Medical Registration Act came into operation in 1913, as far as could then be ascertained there were about 1770 independent medical practitioners holding registrable qualifications. Sir Patrick Hehir marvels at the small recognition by Indian philanthropists of the needs of medicine and hopes to see some of the great wealth of India diverted in the direction of more hospitals and medical schools. He will not have it that officers of the I.M.S. have been encroaching on Indian private practitioners. Everything, he says, points to the reverse, but he would like to see the house appointments at college hospitals thrown open to the successful students of the year irrespective of whether they intend to enter Government service. The Indian Government is the only civilised government in the world which provides for the medical and surgical wants of the entire population and the education of practically the whole medical profession in Western medicine; the time has come for the people to do things for themselves.

A chapter on public health work in India makes it clear that the sanitary work of the Indian army has been one of the best parts of our administration. Sir Patrick Hehir would make it possible for natives of India to obtain a diploma in public health and instruction in tropical hygiene without recourse to the United Kingdom. The unpopularity of the public health department with I.M.S. officers owes its origin to the drudgery of their life, the absence of executive powers, and of scope for genuine ability. But although the hygienic conscience of large towns is awaking, Western sanitation has not yet been grafted into the routine life of the people, and no preventive measures will succeed until the coöperation of the people has been obtained. The unparalleled apathy of the native Indian in face of plagues and famines still remains.

In his concluding chapters Sir Patrick Hehir deals with the Oriental systems of medicine and with the medical work of women in India. He notes the increasing tendency for the women of India to take up medicine as a profession, although at present there are no Government appointments for women doctors and prospects in private practice are not alluring. There is evidence of thought and applied knowledge on every page of this book which makes it an indispensable work of reference for Indian medical study and practice.

SURGICAL DISEASES.

The Pathological Physiology of Surgical Diseases. By Prof. Dr. FRANZ ROST. Translated by STANLEY P. REIMAN, M.D., Chief of Pathological Department of the Lakenau Hospital, and Assistant Professor of Experimental Pathology, University of Pennsylvania. London: Stanley Phillips. Philadelphia: P. Blakiston's Son and Co. Pp. 535. 30*s*.

THIS book gives an account of the normal physiology and the pathological functioning of the different systems of the body when they have been damaged by injury or disease. It is a good compilation ably presented. The author says that the object of his book is to train the student "intellectually" as well as "mechanically" in the art of surgery. This is the accepted modern view of surgical education and the object of the successful attempts to introduce the physiologist and anatomist to the wards. The laborious task of translation has been well done. The book is too good to have a title made up of such a curious combination of contradictory terms.

OPERATIVE SURGERY.

Chirurgie de la tête et du cou. Précis de technique opératoire. Sixth edition. By CH. LENORMANT and PIERRE BROCQ. Prosecteurs de la Faculté de Médecine de Paris. Paris: Masson et Cie. 1923. Pp. 338. Fr.12.

THIS is a précis of operative surgery intended both for students and for medical men in general practice; the latter, according to the preface, should be able to perform any of the operations described in the book. We should imagine that few general practitioners in this country would care to attempt such formidable operations as removal of the upper jaw or the exposure of the pituitary fossa. Many who would have the necessary skill would be unable to use it with advantage in such unusual circumstances. The book is more likely to interest English operating surgeons, who will find in it succinct descriptions of a number of operations very rarely performed in this country, while they will be astonished to find how little known in France are some of our procedures. While several routes by which access can be gained to naso-pharyngeal polypi are described in some detail, there is only one thorough description of an operation for cleft palate, a modification of what in this country is known as Langenbeck's operation; no mention is made of Lane's, or any other flap operation, or of Brophy's procedure. Again, the only route of access to the pituitary described is a trans-sphenoidal one, involving turning down the nose; Horsley's cerebral route is dismissed in a few words as being difficult and dangerous, and Frazier's operation is not even considered.

Other striking divergences from English practice could be quoted, but enough has been said to indicate that readers of this little book will find it stimulating by providing an unusual point of view, although they would probably think it necessary to consult a larger text-book before embarking on an operation which they had only seen described in précis form, with but little reference to the difficulties, dangers, and complications. The book is well printed and lavishly illustrated.

PROGNOSIS OF INTERNAL DISEASES.

By HENRY L. ELSNER, M.D., LL.D., Professor of Medicine, College of Medicine, Syracuse University. London and New York: D. Appleton and Co. 1923. Pp. 1276.

THIS is a valuable book. Not only does the author discuss the prognosis of each disease, but he has been at pains to examine the prognostic importance of the chief complications and sequelæ in each case. In many cases he quotes valuable statistics as to the incidence of such complications, and at the end of each section the well-selected bibliography will be found of value by those anxious to read more deeply into any particular subject. Many laboratory tests are discussed, the utility of each from the prognostic point of view being carefully considered. It may, in fact, be said that at a time when medical text-books are multiplying with bewildering rapidity Prof. Elsner has produced a volume whose originality gives it an especial interest.

HEPATIC AMŒBIASIS.

Les Hépatites Amibiennes: Autochtones et Coloniales et Leur Traitement. By F. FRANÇON and J. HUTINEL, with a Preface by Prof. CHAUFFARD. Paris: Gauthier-Villars et Cie. 1923. Pp. 130.

HEPATIC amœbiasis in its manifold clinical guises is always a subject of very great interest to the physician in the tropics, and is, moreover, one with which the general practitioner, and even the specialist, in non-tropical countries is apt to be unfamiliar. This brochure by two distinguished French clinicians who gained their experiences of amœbic hepatitis and liver abscess during the war, is opportune. The diagnosis, ætiology, and pathology of these conditions are discussed with full references to the main contributions on the subject. The pleuro-pulmonary complications of liver abscess are admirably described, and recent experience has fully demonstrated the great value of the recognition of the true significance of signs at the right base. It is unfortunate that the authors should often convey the impression of attaching too great importance to the views of authorities quoted while relying too little upon the results of their own experience. A very full bibliography of 243 references is attached.

PSYCHOLOGY.

Recent Psychology and the Christian Religion. By CYRIL E. HUDSON, M.A., Assistant Curate, S. Mary Abbots, Kensington. London: George Allen and Unwin. 1923. Pp. 121. 3*s*. 6*d*.

THIS writer shows more than a literary knowledge of the first part of his subject and is to be congratulated on his sympathetic understanding. His theme is the relation of psycho-analytical observation and theory to Christian belief, and in his frank consideration he only once seriously departs from a correct statement of the position. That is when he attributes to the "Freudian school" the belief that "all human conduct, all human ideas, philosophies, religions, ideals, are the product of unconscious sexuality," a frequently repeated grotesquerie which has been dealt with by Freud in his "Introductory Lectures." A similar failure to go to original sources is indicated on p. 104, where a casual footnote reveals that Mr. Hudson has accepted a newspaper version of Prof. Sherrington's address to the British Association which ascribed to him a view of the mechanical interpretation of mind directly opposed to that which he really expressed. One feels compelled to point out these blemishes because they are not in harmony wth the rest of the book. The chapter on psychoanalysis and sin is, if one may be pardoned the emphasis, a remarkably honest presentation of psychoanalytical methods, difficulties, and results. In discussing free will the author is surely swayed by a primitive instinct when he rejects McDougall's sole justification of punishment of the wrong-doer—the hope that it may "modify his nature for the better"—and says, "This position seems to make *blame* or *censure* meaningless"; if blame or censure has no modifying influence it certainly is meaningless, except as a mild gratification of the desire for retribution.

As seems inevitable in a discussion of first principles, the argument of the book will succeed or not according to the temperament and "complexes" of the reader. In those matters—and they are vital—in which he differs from "the psychologist who is also a thoroughgoing evolutionist," Mr. Hudson is scrupulously fair in presenting the views of the other side: one wishes that all controversialists were like him.

Evolution of the Conscious Faculties. By J. VARENDONCK, D.Litt., D.Sc. London: George Allen and Unwin. 1923. Pp. 260. 10*s.* 6*d.*

THIS is a continuation of the theme of Dr. Varendonck's "Psychology of Daydreams." Formerly he showed how practised introspection had enabled him to trace his own pre-conscious thoughts and to deduce certain tendencies operative just below the level of consciousness. In the present work he distinguishes between reduplicative and synthetic memory; even in mankind the former need not be associated with consciousness, and it determines the automatic and reflex behaviour characteristic of lower stages of evolution; but the necessity for choice determines repression of a certain amount of reduplicative memory and demands selection and synthesis to guide the reaction to external excitations. In this way the conscious faculties of man, in whom choice is continuous, develop from those of the animal, which only from time to time departs from reduplicative action.

In spite of an involved style, Dr. Varendonck produces in his readers a sense of the reality of his subject. His work is now coming to form a useful link between the intellectualist psychology and the psychology that studies processes which take place at the lower and more primitive levels of the mind.

LABORATORY DIAGNOSIS.

Traité de pathologie médicale et de thérapeutique appliquée. Diagnostics de laboratoire. II. Tumeurs, par M. P. MASSON, Professeur d'Anatomie Pathologique à la Faculté de Strasbourg. Paris: A. Maloine et Fils. 1923. Pp. 797. Fr.50.

THIS volume is the twenty-seventh of the whole series and the second dealing with laboratory diagnosis; if all the other volumes of the series are up to the standard of this one they deserve to be more widely known in this country. This particular volume is designed for the use of the practising morbid histologist, and consequently, in addition to a general theoretical discussion of the nature and growth of tumours, both granulomatous and neoplastic, and a full description of tumours of all sorts, it comprises an extensive and useful section on histological technique.

The "Etude Théorique des Tumeurs" is neither more nor less useful than such discussions usually are. The "Etude Concrète," however, is excellent; no class of tumours seems to have escaped the notice of the author, and of all of them his descriptions are admirably clear. What is more, these descriptions are accompanied by illustrations constituting the most valuable feature of the book; they are numerous, and the author has wisely not included a single microphotograph. In hardly any instance could the veriest tyro fail to identify a section from its appropriate illustration—and how seldom can this be said of microphotographs.

Morbid histology in this country, when it derives from abroad at all, tends to do so from German, to the exclusion of other, sources. Perusal of this book calls attention to a number of interesting points not usually stressed in this country; for instance, the form of chronic mastitis, called by the author "Maladie de Reclus," occurring in young women, and illustrated by him in Fig. 49, is one which, though occasionally met with, has escaped the notice of most English writers; most pathologists will readily recognise it from the illustration, although some might disagree with the author's description of it as a "hyperplasie myo-epithéliale." Volkmann's view of the endothelial nature of the mixed tumour of the parotid is only mentioned that the author may insist on its untenability, and it is quite time that in this country the name "endothelioma" ceased to be mentioned in this connexion. On myeloid and melanotic "sarcomata" also the author holds views well worth the consideration of English workers.

And all pathologists in this country will greet with applause the author's concluding passage: "L'histodiagnostic est un acte médical. C'est une consultation médicale dans laquelle la responsibilité de l'histologiste est gravement engagée, d'autant plus que son expertise est demandée en général en dernier ressort et commande la thérapeutique. Médecin, l'histologiste doit être payé en raison des services qu'il rend."

LIFE OF SIR T. P. ANDERSON STUART, M.D.

By WILLIAM EPPS, Secretary of the Royal Prince Alfred Hospital, Sydney. Sydney: Angus and Robertson, Ltd. 1922. Pp. 177.

THIS interesting book is partly autobiographical and partly matter compiled by Mr. Epps from documentary evidence supplied by Stuart together with personal recollections of the subject of the memoir. As Mr. Epps says himself, the book, owing to circumstances of publication, had to be cut down by about one-half and this has somewhat affected its balance, continuity, and smoothness, but the admirable introduction gives an excellent sketch of Stuart's many-sided character and activities, which sketch can be supplemented at the reader's will by reference to the main body of the work.

Thomas Peter Anderson Stuart was born in Dumfries in the year 1856, the son of Alexander Stuart and Jane Anderson his wife. He was educated at the Dumfries Academy and at the age of 14 was apprenticed to a chemist and druggist. After two years he decided to enter the medical profession, and after passing the preliminary examination during a further 18 months went to Wolfenbuttel in Germany, where he acquired a fluent knowledge of French and German. In November, 1875, he began his university career at Edinburgh, and his memories of those days and his recollections of Lister, W. Turner, and T. Keith are well worth reading. We think that his memory must have betrayed him in one small point and that is where he says (p. 29) that at this date "I saw the first young lady without a crinoline, which had been universal up to this time." He took his M.B. in 1880 and passed the first M.R.C.S. and primary F.R.C.S. Eng. examinations, obtaining in the latter 24 marks out of a possible 25. He then accepted the post of demonstrator to Prof. Rutherford, carrying with it that of assistant professor of physiology. The agreement between them, which Mr. Epps gives in full, is a curious and interesting document. With regard to fees for lectures, the Edinburgh professors in those days collected by themselves—i.e., they sold the class tickets at the door of the lecture room, "taking the money with their own hands and giving change." Stuart stigmatises this custom as "rather degrading," but whether this be so or not the custom was simply a survival of mediæval university practice, when learned doctors used to employ a couple of students to negotiate with other students as to how much each was to pay. Rashdall (Universities of Europe in the Middle Ages) gives a delightful quotation from the works of Odofredus, an eminent jurist of Bologna, announcing at the termination of one course of lectures that next year he would give no afternoon lectures because the scholars were not good paymasters, "quia volunt scire, sed nolunt solvere." The same custom of payment obtained at Paris and Oxford.

Then came the great turning point in Stuart's life, for in 1882 the Government agreed to find the money for the provision of a medical school in the University of Sydney and applications were invited for the chair of anatomy and physiology. Various competent bodies were asked to nominate a professor, and the University of Edinburgh, the Royal College of Surgeons of Edinburgh, the College of Physicians in Glasgow, and the Royal College of Surgeons of England were asked for their views. All these bodies unanimously nominated Anderson Stuart. He arrived in Sydney in 1883 and found that the medical school consisted of "a little four-roomed cottage with walls about half-way up." How the school grew both in numbers and in the various buildings from this small beginning—4 students in 1883 and 857 in 1919, while the progress of the buildings is shown by the two photographs opposite pp. 52 and 114 respectively—must be read in Mr. Epps's striking narrative. This was Stuart's life work; to this end he organised, cajoled, and drove anyone who by reason of learning, interest, or money could further his heart's desire. And all the time he was teaching as only a master could teach, besides filling such important posts as that of Government medical adviser, President of the Board of Health, and chairman of the Board of the Royal Prince Alfred Hospital. Stuart died in 1920 of an internal malignant growth, of which he first became aware in 1919, and he passed the last year of his life under sentence of death with the same courage which he had always shown during his working years. A great man to whom anyone seeing the medical school of the University of Sydney may well apply the well-known epitaph of Wren.

A GREEN OLD AGE.

By Prof. A. LACASSAIGNE. Translated by HERBERT WILSON from the second French edition. London: John Bale, Sons, and Danielsson, Ltd. 1923. Pp. 321. 15*s*.

THE increase in the expectation of life which has become so marked during the last 50 years is apparently responsible for a corresponding increase in the number of books upon old age and what may be called its management. Prof. Lacassaigne's book on the subject is one of the best which we have seen. He has himself arrived at an age which even in these days may be called advanced, for he was born in 1843; he is a medical man and professor of legal medicine in the Faculty of Medicine at Lyons, is learned and widely read. We know on the best authority that the "cruda viridisque senectus" is the attribute of a god,[1] but a study of Prof. Lacassaigne's book will enable mere mortals, if not to attain old age, at least to enjoy the fresh and youthful senescence spoken of by Virgil. It is full of sound advice and the advice is accompanied by a wealth of illustration drawn from literature both ancient and modern, from artists, and from examples of those who have attained old age and found it green. Those whose years are declining will learn if they digest the principles laid down by Prof. Lacassaigne how to temper the sadness of Ecclesiastes' picture of old age by remembering Nestor, who "yielded not to grievous old age."

JOURNALS.

IN the MILITARY SURGEON for August there is a paper on Chemical Warfare and its Relation to the Medical Department by Lieut.-Colonel H. L. Gilchrist, Medical Corps, U.S. Army, who was, in the war, medical director of the Chemical Warfare Service, and afterwards head of the American Typhus Expedition to Poland. In the war we used to speak of "gas," but in future shall, he thinks, talk of "chemical agents." As these are generally heavier than air, they settle into shell-holes and dug-outs, making them dangerous, so positions on high ground will be more coveted than ever. The best protection is a gas-mask, but even a moistened handkerchief, wetted (it may have to be) with urine, is often of great value. Alkaline applications are recommended, ammonia for inhalation, weak (2 per cent.) bicarbonate of soda solution for the eyes, lime water and stronger soda solutions for the skin or to be taken by the mouth. Orderlies should be specially trained in first-aid for chemical casualties; they themselves at such times wearing always protective masks, gloves, and clothing. Every field ambulance should carry, for each person it is equipped to deal with, one litre bottle of oxygen, to be put on the stretcher with him if gassed, between his legs, its outflow being led by a rubber tube into his mouth or nose. Steam disinfection best gets chemical agents out of clothing; and shower baths, to free patients from mustard gas, should be pushed well forward, even in a battle to within five miles of the front.

Lieut.-Colonel E. L. Ruffner has a paper on the Citizens' Military Training Camp, which seems to be a very interesting effort of the Government to encourage the physical development of the people. The camp is in summer, it lasts a month, and is free to any young man over 16 and physically fit. Those who come get systematic physical training, education in discipline, order, and neatness, swimming, baseball, and other games, and are vaccinated and inoculated against typhoid, all for nothing. Colonel Ruffner was himself on the staff of such a camp in 1922; there were 2582 men in his, and the average gain in weight shown was 2½ lb. All were medically inspected on arrival, and only two serious cases were sent to hospital during the month. The State paid for their holiday and their teaching, just to make them better citizens, requiring of them no contract of service!—Dr. H. Lilienthal figures a simple and ingenious method for holding Carrel's tubes steady in a superficial wound. The tubes are bent at the ends, like capital J's, and the curved portions are worked into paraffined gauze which does not stick to the granulations, and out of the gauze the tubes do not tend to slip. This simple expedient was devised by a nurse, Miss Hervey, who served with the British Army in France.

An interesting paper shows that the disease called tularæmia is a *Bacterium tularense* septicæmia. It was first recognised in Tulare County, California, in 1912, by McCoy and Chapin, when investigating a novel epidemic amongst ground squirrels. It is found also in rabbits, and may be inoculated into guinea-pigs. It causes patches of necrosis on the livers of the rabbits, and cooks and butchers who handle these livers become infected if they have abrasions on their hands. There is inflammation at the point of entry, adenitis is associated, prostation and fever follow, with slow recovery after a month or two. Thirteen days after invasion the blood serum, in a dilution of 1 in 100, agglutinates cultures of *B. tularense*. The bacterium does not grow on ordinary agar, and only scantily on blood-agar, but, it is found by Surgeon Edward Thomas, of the U.S. Public Health Service, who presents this paper, it will grow freely on a serum-agar, with glucose (1 per cent.) and cystine (0·1 per cent.), and this in original isolation or in subcultivations. This disease was first found on the Pacific Coast, but Surgeon Thomas has found it on the Atlantic Coast too, for, out of 914 rabbit livers, taken in the market of Washington, D.C., he found seven were infected.

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[1] Aen., vi., 304.

THE LANCET.

LONDON: SATURDAY, SEPTEMBER 29, 1923.

THE COMING INSURANCE SETTLEMENT.

THERE remain but three months before the end of the year, when new conditions for medical service under the Insurance Acts will come into force, and although the final proposals have not been made or accepted a large measure of agreement has been reached by conversations between the Ministry of Health and the Insurance Acts Committee of the British Medical Association representing panel practitioners. The fixing of the capitation fee was left until substantial agreement had been reached in regard to the services to be rendered for that fee, and within the next day or two the actual proposal in shillings and pence will reach the Insurance Acts Committee in time for its meeting on Oct. 4th. The final proposals both as regards terms and conditions of service will then be sent down to the panel committees in order that their representatives may come to a final decision in annual conference on Oct. 18th. No commendation would be too great for the spirit in which these conversations have been carried on.

Setting aside the amount of the capitation fee, which is as yet speculative, many points in regard to the terms of service have been decided to the satisfaction of all parties. These include in general terms: the limitation of panel lists, the free choice of doctor, the procedure of the Medical Service Subcommittee, procedure in regard to excessive prescribing, the right of the practitioner to have a patient removed from his list, and the access of the regional medical officer to the doctor's premises. Agreement has not been reached in regard to the right of panel committees to initiate complaints. Unless this concession is granted without giving the approved societies further facilities on their side for raising complaints, the panel medical service prefers to leave matters as they are. The proposal of the panel service to formulate a schedule of services that are outside the doctors' contract has not been accepted, and is not to be pressed, although the Insurance Acts Committee believes that such a schedule would be useful to all parties. The panel service is firm in its refusal to accept liability to give an anæsthetic or provide the services of an anæsthetist in connexion with *any* operation performed by *any* medical practitioner, although ready to make substantial concession. It is on the medical certification rules that the panel service is most keenly disappointed, for its proposals for the drastic reduction of the number of forms have not been accepted; the Insurance Acts Committee still believes that a friendly talk would solve the difficulties. The Committee's suggestion is in brief that all forms should be on two pieces of paper and that practitioners should be given the option of having these forms bound in one or other of two ways: (1) a separate book for each kind of certificate, (2) a book to contain copies of each kind of form—the one to meet the needs of urban, the other of rural practice. On one other knotty point disagreement remains. The Ministry endorsed the suggestion of its Insurance Consultative Council that in view of the unrestricted right to transfer at any time, there was no longer justification for allowing practitioners to treat insured persons as private patients. While the Insurance Acts Committee recognises the possibility of abuse, it regards the solution of this problem by regulations as impossible, holding that professional honour and increased knowledge on the part of the insured person must still be relied upon. There are insured persons who insist on exercising their inherent right not to accept the benefits for which they have paid, or who insist on going to another panel practitioner for a second opinion without mentioning the fact. Panel practitioners are often called into consultation by each other, and if no fee could be offered all consultation work of this kind would be transferred to non-panel practitioners.

We have emphasised the remaining points of divergence, although the measure of agreement is the striking feature of the situation. The agreement is indeed much greater than would be supposed to be the case from a perusal of the presidential address at the annual conference of friendly societies, which we summarise on another page. Public utterances of protagonists, although worthy of study, need not be taken quite at their face value. As the Insurance Acts Committee points out in the last sentence of its last communication, the two departments—namely, conditions of service and rate of remuneration—are indissolubly related, and any satisfactory arrangement arrived at must include both. We have substantial cause to hope that with the spirit now prevailing an arrangement will be reached towards the end of next month which will ensure good value to the insured person and willing service from the panel doctor.

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THE CARE OF THE MENTALLY DEFICIENT.

THE annual report[1] of the Metropolitan Asylums Board is a recurrent reminder of the scope and variety of remedial work which this Board undertakes. To the London medical student who thinks of the M.A.B. hospital as synonymous with the treatment of scarlet fever and diphtheria, with a sprinkling of typhoid, it may be necessary to recall that the Metropolitan Poor Act, 1867, empowered the combined parishes of the metropolis to establish asylums for the reception and relief of the sick, insane, and infirm, or other classes of the poor, without limitation to any particular infirmity; and over and above its hospitals for the common infectious diseases, for small-pox, for venereal diseases, and for tuberculosis, the Board administers mental hospitals, with a total accommodation of 8800 beds and an industrial training colony for 2200 mental defectives. In these institutions the patients are classified from the higher grade of improvable patient in training at Darenth to the senile dements at Tooting Bec and the lower grade of imbecile child at Caterham and the Fountain Hospital, Tooting; the advantage of pooling the subnormal mental population of the metropolis has been amply justified by the increased efficiency achieved by classification. The average annual number of new admissions from the metropolis is just over 1500, and there are now more than 1600 patients received by agreement with provincial authorities under the Mental Deficiency Act of 1913, in spite of the fact that the war rendered this Act largely nugatory. Some minor rearrangements have been carried out during the year, including absorption of the special children's receiving home at Tooting Bec into the general accommodation of the hospital, and some adjustments at Leavesden and Caterham designed to reduce waiting lists and increase efficiency. All the patients at the Bridge Training Home, Witham, Essex, were transferred during the year to Darenth, where the industrial work has attained very large proportions. There is an output of over 20,000 envelopes weekly from the bookbinding shop, a weekly average of 112 new or remade mattresses from the upholstery shop, 400 pairs are dealt with weekly at the boot-making shop, while brush-, basket-, and mat-making are in full swing, and the tailoring shop is kept full up with orders. All this work is so important that we welcome the expansion of the annual report to its original size and form, in which a special section, edited by Dr. E. B. Sherlock, director of the Board's Mental Hospitals Service, is devoted to mental diseases.

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[1] To be obtained from the office of the Board, Victoria Embankment, London, E.C. 4. 5s. Mental Diseases Section separately, 1s.

As a training ground for nurses the M.A.B. mental hospitals provide an immense scope. Dr. Sherlock contributes to the report a note on mental nursing which is of particular value at a time when the relation of general and special nursing is being so closely considered. Certain American States are now making it compulsory on nurses who accept registration from the State to have received some psychiatric training, and, under the auspices of the General Nursing Council, proposals on similar lines may eventually be made in Great Britain. General and mental nurses have already been placed on the same footing so far as this Council is concerned, and to gain admission both to the general and to the supplementary part of the Register, five years' training will be necessary, of which three must have been taken continuously in an approved hospital whether general or mental. The certificate of the Medico-Psychological Association is of great value to the special nurse, for it distinguishes in the third year between mental nursing and the nursing of mental defectives, albeit the whole period of training for the certificate must still be passed in one recognised institution. The Association is continuing at present to grant certificates, although after June, 1925, the examinations of the General Nursing Council will supply the only means of reaching the Register. Dr. Sherlock concludes his timely note with an inquiry into the respective value to mental nurses of experience and of the capacity to pass examinations, a query which he leaves for the moment unanswered. The Board's mental hospitals and training colony are also available for post-graduate medical study as they have been placed on the list of recognised institutions in connexion with diplomas in psychological medicine. This is also the case with the Royal Earlswood Institution at Redhill, which offers facilities for the scientific study of all classes of mental defectives; demonstrations and lectures are given periodically to post-graduate and other students from London medical schools, and the resident appointments should prove attractive to scientific workers willing to coöperate in the solution of the many problems still surrounding the ætiology, pathology, and treatment of mental deficiency.

Amongst the causes assigned in the Earlswood report for the mental deficiency of the 35 recent admissions are heredity, shock or indisposition of mother, prolonged labour or instrumental delivery in eight each; tuberculosis or tuberculous history in three; premature birth in two; and of the following—consanguinity of parents, fright, meningitis, convulsions, encephalitis lethargica, pituitary insufficiency—one example of each. Twenty-one, or 60 per cent., of those admitted in 1922 were under 14 years of age, but there is a large adult population accumulated during the 75 years of the institution's existence, and 16 are referred to as being over 65 years of age and four over 75. The inmates are drawn from varied social classes, 15 being classified as free cases, 19 as life payment cases, 168 as elections and part payment cases, and 20 as payment cases aided by public and local authorities under the Mental Deficiency Act. It is unfortunate that a technical difficulty has arisen in regard to the further admission of patients of the last-mentioned class, the Board of Control demanding as a condition of Treasury grants towards maintenance certain "contracts" which the Earlswood Board are unable to undertake. Details are given in the report as to the care, treatment, education, industrial training, and recreations of the inmates, the medical side of the work being in the hands of Dr. D. Hood, hon. consulting physician, and Dr. C. Caldecott, medical superintendent. The establishment of further institutions for defectives under the provisions of the Mental Deficiency Act will no doubt open careers for those desiring to specialise in this work. Moreover, there is at Earlswood a considerable scope for attaining experience in the management of diseases of children, especially of nervous type, which may be serviceable in ordinary practice.

DIFFERENTIAL ACTION OF X RAYS.

When a beam of X rays passes through the tissues it gives rise in them to reactions which vary in severity with the nature of the tissue traversed. This is generally referred to as the selective action of the rays; it is one of the few indisputable facts in radiotherapy and is the solid basis upon which that therapy rests. There is, however, another and scarcely less important aspect of the effects of these rays upon cell life, and that is whether a differential action exists. The question was put by Perthes as early as 1905 whether, in the absorption of the same quantity of soft and hard rays, the same physiological effects are produced. Since that date a good deal of evidence, mostly derived from clinical experience, has been brought forward by the French school of radiologists to show that in the case of the human skin differential action of this kind takes place. Their methods of measurement, however, lacked the precision which is necessary to settle such a question, and some years later the experiments of Friedrichs upon a variety of organisms led him to the view that no such action existed. In our present issue a series of experiments are described by Prof. S. Russ which seem to establish the position once more for a true differential action. It is maintained by the author that this proof depends entirely on the method which is used to measure the various doses of X rays in question. The customary method of measurement among physicists has been one based upon the ionising power of X rays, a method that has served them so well in the past that it is difficult to understand the long delay for its acceptance in medical radiology. Even so, however, the method has its pitfalls when accurate quantitative data are required and these are dealt with at some length by Prof. Russ. For the specification of X rays two quantities are essential—viz., their wave-length and their intensity. Spectrometer methods are now available for the former, but for the measurement of the intensity there is no unanimity at present. We understand, however, that a joint committee of the Physical and Rontgen Societies has been formed with the object of defining a standard of X ray intensity which shall eventually enjoy international sanction and usage. If the main feature of interest in a differential action of X rays lies in its relation to the technique of the therapeutic application of these rays, it has an important bearing on the general theory of the causation of the biological actions to which the rays give rise. So far the author has determined numerical ratios for only two varieties of tissue over a moderate range of the X ray spectrum. An extension of this class of observation, both in the range of the radiation and in variety of tissue should put us in a position to evaluate the physiological response in a more general sense than is possible at the present time.

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AYURVEDA AND UNANI.

IT is intriguing to think that the drug lore of the Eastern world has not yet been fully exploited in the interests of scientific medicine. The discovery of the healing value of opium and quinine has its parallel in the romantic search in tropical jungles for the rare chaulmoogra tree. One of the best-equipped laboratories in India—namely, that of the Calcutta School of Tropical Medicine—is now occupied with the investigation of indigenous drugs, and Major R. N. CHOPRA and his assistants are examining berberine and other reputed anti-malarial drugs, in the hope that some of the remedies used by the ancient Indian systems of medicine may prove cheaper and more efficient than those imported at great cost from Europe. At this point the indigenous systems have been deemed worthy of an exhaustive report by one of the largest provincial Governments in India, and we are able to publish this week in another column a summary by our special correspondent of the conclusions of a committee appointed in November, 1921, by the Madras Government. Able and interesting as this report is, we doubt whether it will advance the repute of the Ayurvedic and Unani systems of medicine. The memorandum by Dr. S. MURTI, secretary of the committee, removes the report from the ordinary criteria of reason by stating that every system of Hindu thought is at once philosophy, science, and religion, all in one and one in all. Dr. MURTI gets over the present lack of modern scientific equipment by premising that the old Hindu teachers, by improving their own internal organs of sense, could extend their range of perception to include the visualisation of the atom. Modern conceptions of catalyst, enzyme, and hormone have for him had their precursor in the mysterious humours of Ayurvedic theory.

It is sadly apparent that, if there is no more to be said for this system than Dr. MURTI has to say, modern medicine has little to hope for from its contribution. The truth appears to be, as Sir PATRICK HEHIR justly and moderately states in a monograph reviewed in our present issue, that Ayurvedic medicine has remained stationary since the Middle Ages, and that while the Unani system, with its Rhazes and its Avicenna, helped in the foundations of Western medicine it ceased to be affected by the advance of science after being carried to India by the Mohammedan invaders. Both systems have, in fact, undergone serious deterioration, for new religions were introduced, caste distinctions became more rigid, and the Brahmins, fearing to touch blood or diseased matter, left the study of medicine to the lower and illiterate castes; so that when the British founded medical schools and hospitals in India 120 years ago the native systems were in the last stage of decline. The more advanced Ayurveds now practise a hybrid combination of the Western and Oriental systems. Dr. M. C. COMAN, attached to the Medical College at Madras, failed to find marvellous properties in any drug not already known to Western medicine, and even on the plea of economy he found that the cost of maintaining an Ayurvedic dispensary was much the same as that of any other dispensaries. Dr. COMAN did, however, find a few drugs worthy of future study, including *Hydnocarpus inebrians*, potent in ameliorating the complications of leprosy, *Artemisia maritima*, a substitute for santonin, and *Boerhavia diffusa*, a good diuretic for anasarca. Sir PATRICK HEHIR demands a comprehensive investigation of native drugs and curative methods, asking for a more or less permanent committee, consisting of chemist, physiologist, pharmacologist, along with a native practitioner of high repute. His own feeling is that the attitude of indifference and hostility has been not altogether wise, for it has tended to the creation of a harmful class of quack and charlatan. The Hindu system could hardly have survived for over 2000 years, nor the Arabic system for many centuries, if they did nothing but harm, and the desire now becoming vocal on the part of Ayurvedic and Unani practitioners to bring their systems into more intimate relation with modern scientific medicine deserves recognition. We shall ourselves benefit by acquiring the useful parts of their knowledge.

Sir PATRICK HEHIR strikes a note of warning, for he does not believe that Western medicine has got as firm a hold on the people of India as many have supposed. The Medical Registration Act of 1916 neither included nor expressly excluded practitioners of Oriental systems, and he would solicit their coöperation in formulating curricula of education and in prescribing the courses of theoretical and practical training over some years before granting qualification to practise. Gradually the science of modern medicine could be introduced into the Oriental systems, which would then become instruments for conferring vast benefits on the people of India. There may be no other way in which adequate medical treatment will reach the masses of India in the immediate future.

Annotations.

"Ne quid nimis."

THE CENTENARY OF "THE LANCET."

ON Sunday, Oct. 5th, 1823, the first number of THE LANCET appeared, and in celebration of the event a special number of the journal will be issued on Oct. 6th, and a Centenary Dinner will be held in London on the evening of Thursday, Nov. 29th, at the Hotel Victoria, Northumberland-avenue, London, W.C., at 7.30 for 8 P.M. Sir Donald MacAlister, President of the General Medical Council, will take the chair, and will be supported by the Presidents of the Royal Society, the Royal Colleges of Physicians of London, Edinburgh, and Dublin, the Royal Colleges of Surgeons of England, Scotland, and in Ireland, the Chief Medical Officer of the Ministry of Health, the President of the British Medical Association, and the Presidents of the Royal Society of Medicine and of the Medical Society of London. The Minister of Health has signified his intention of being present, and it is hoped that a gathering representative of all the interests associated with the medical profession will meet on this occasion. Those who desire to be present should communicate at their early convenience with Mr. H. D. Gillies or Dr. J. H. W. Laing (hon. secs.) at 7, Portland-place, London, W. 1.

The charge for the dinner has been fixed at 15*s*., exclusive of wines, and if notice be given in advance endeavour will be made to arrange that friends who so desire shall sit together.

PRIMARY CARCINOMA OF THE THYMUS.

Dr. Victor C. Jacobson,[1] of the Peter Bent Brigham Hospital, Boston, who records an illustrative case, remarks that primary tumours of the thymus are uncommon, primary carcinoma, of which this case is an example, being exceedingly rare. The first diagnosis of carcinoma of the thymus seems to have been made by Bristowe in 1854. Only 2 cases have appeared in American literature, 13 have been recorded by French writers, all between the years 1890 and 1908, and 6 by English and German observers, or a total of 21 cases. Fourteen were males, 3 females, and in 4 the sex was not recorded. The age-incidence differs from that for epithelial growths in other organs. Altogether 15 patients were of the "cancer age," 6 were aged from 18 to 22. The relatively high percentage of thymic tumours in young persons is explained by the early evolution of the thymus as compared with other organs. In 3 of the recorded cases no metastases are mentioned. Lung metastases were reported in 4 cases, direct extension into overlying lung tissue was noted in 2 cases, in one of which the mediastinal lymph glands were involved. In one instance there was growth into the superior vena cava, and in two others the pericardium was affected. In only two instances in which nodules were present in the liver was a tumour found elsewhere than in the thorax. Dr. Jacobson's case occurred in a man aged 42, in whom the outstanding clinical features were the lack of local signs of thymus tumour and the predominance of symptoms referable to the destruction of several vertebræ. The symptoms were increasing pain and stiffness in the back and hips, and lower dorsal kyphosis. In spite of the large amount of lung tissue replaced by tumour the patient had little respiratory distress until shortly before death, which occurred after about eight months' illness. Although he also had acute appendicitis, all pain and tenderness in the appendix region were masked by the constant severe pain caused by the tumour in and about the vertebral column. The thymus tumour itself was comparatively small, and could not have caused much mechanical inconvenience. The lymph and blood-streams, however, were invaded early, the tumour being brought to the lungs by the pulmonary artery. In the lungs tumour cells gained entrance to the pulmonary veins and, reaching the systemic circulation, invaded the spine, liver, and suprarenals. The greatest interest from the pathological standpoint was the peculiar degenerative changes in the nucleus and cytoplasm of the tumour cells in the thymus and in the secondary growths.

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[1] Archives of Internal Medicine, June 15th, 1923.

THE WELFARE OF THE BLIND.

THE Blind Persons Act of 1920 imposes the duty on county and county borough councils to promote the welfare of blind persons ordinarily resident in their area. The fourth annual report of the Advisory Committee on the Welfare of the Blind records the progress now made. There are only four out of 145 local authorities who have not yet submitted schemes to the Ministry of Health for approval, and the majority of these schemes are now in operation. Their financing depends partly on the rates and partly on subsidies from the Ministry of Health, but the principle of making full use of voluntary agencies and the grant to them when necessary of financial assistance is maintained. This principle has been objected to by some theorists, but the fact remains that up to the present there has been no reduction of voluntary contributions to the funds of agencies for the blind. Out of a total of £75,000 paid by the Ministry of Health last year in respect of services provided for the welfare of the blind £33,000 went to workshops, £9000 to home workers, and £14,000 to home teaching. With regard to workshops for the blind the report states that workers in them may be grouped in four categories: (*a*) 60 per cent. are good workers, able to earn at trade-union rates 16*s.* a week in the case of men and 8*s.* a week in the case of women; (*b*) 8 per cent. are good workers but slow; (*c*) 28 per cent. are of low earning capacity capable of common work only; (*d*) 4 per cent. are devoid of any real earning capacity.

In view of the large proportion of low wage earners, the Committee recommends that there should be an efficiency and productivity test before any blind person is admitted to a workshop, and the Ministry of Health has given notice that from April 1st, 1924, it will not be prepared to recognise for grant purposes any blind person as a journeyman until satisfied that he has attained as high a standard in the quality, speed, and independence of his workmanship as is reasonably attainable by him. The problem of assisting home workers presents greater difficulties than that of assisting workshops. At the present time there are about 1000 recognised home workers, and for the time being the Committee recommends that earnings should be augmented at a flat rate not exceeding 10*s.* a week. A more important matter is the supply of teachers for home workers, and a good deal of attention has been paid to it. All home teachers, in order to earn the grant, must now pass the examination of the College of Teachers within two years from the date of their appointment. The first of these examinations was held last May at the School for the Blind, Swiss Cottage, when over 50 persons, all of them home teachers, presented themselves for examination. Besides these two classes of blind workers the Committee have approached the question how far it is possible for employment to be found for some of them in factories and workshops where ordinarily only seeing operatives are employed. In Germany it is said that as many as 450 blind persons are actually employed in ordinary factories and workshops. The report appeals to the employers of this country to interest themselves in this matter, and to grant facilities for testing the ability of blind persons to perform simple operations usually carried out by seeing workers.

The degree of blindness which qualifies for assistance under the Act is a matter needing more exact definition than it has yet had. There are a number of border-line cases who may have been encouraged for a number of years to regard themselves as blind, and the Committee favours the continuance of grants to these. On the other hand, there are a number of children in blind schools to-day, chiefly myopes and subjects of phlyctenular keratitis, who are weak-sighted but not blind. It is in the interests both of the country and of themselves that these children should be allowed to use the sight that they have under proper supervision, such as is given at the L.C.C. myope schools.

AUTO-PYO-THERAPY.

THE practice of auto-sero-therapy does not seem to be as popular as it was some years ago, and the results of the subcutaneous injection of a few c.cm. of a pleural effusion taken from the same patient have not been uniformly good. A treatment which bears at least a superficial resemblance to auto-sero-therapy has lately been advocated by Dr. Endre Makai,[1] head of a surgical children's hospital in Budapest. For more than a year he has been treating every case of localised suppuration by auto-pyo-therapy, dispensing altogether with a knife, and adopting a procedure the technique of which is perfectly simple. The pus in an abscess is aspirated, and 1 c.cm. is immediately injected subcutaneously, this procedure being repeated every fifth day as often as necessary. Several such injections have been given in each of more than a hundred cases, the ages of the patients, most of whom were children, ranging from infancy to 40. In the case of closed, cold, tuberculous abscesses, the subcutaneous injection of 1 to 10 c.cm. of the pus never gave rise to a troublesome general reaction such as fever or general malaise. On the contrary, there was often a dramatic improvement with gain of weight. At first there was no local reaction. As the injections were repeated, more and more definite areas of painless infiltration would appear. The microscopic changes in such areas were characteristic of tuberculosis, but tubercle bacilli were not demonstrable, and the infiltration always disappeared automatically. After two to eight injections, during which the pus steadily became more fluid and transparent, the abscesses dwindled or disappeared completely. Curiously enough, the subcutaneous injection of another patient's cold abscess into a person suffering from the same complaint had no effect. Good results were also obtained when a cold abscess communicated with the exterior by a fistula.

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[1] Deut. med. Woch., August 31st, 1923.

but in these cases the site of the injection was apt to show a severe reaction. Most of Dr. Makai's cases of suppuration were, however, due to non-tuberculous organisms such as streptococci, staphylococci, coliform bacilli, and the like. In none of these cases did the treatment provoke progressive infection, a phlegmon, or sepsis. In about 30 per cent. there was no reaction at the site of the injection, and in another 30 per cent. a slightly painful infiltration disappeared completely and spontaneously in eight to ten days. In the remaining 40 per cent. a definitely circumscribed abscess formed at the site of injection, healing spontaneously or after aspiration. Although hundreds of such injections were given, it was necessary only in two cases to make a 3 mm. long incision. Only localised suppurative processes were, as a rule, thus treated, and among the cases there were some of suppuration in the cervical and inguinal glands, empyema, mastitis, periostitis, mastoiditis, and osteomyelitis. There were, however, two cases of severe progressive phlegmon of the neck in young children successfully treated in this manner, and one of the illustrative cases recorded in detail was that of a child, 18 months old, the right lower lobe of whose lung contained a cavity of the size of an egg. Puncture of this cavity, which was diagnosed by the X rays, yielded gaseous, greyish-yellow, thick pus containing elastic fibres, the *Bacillus fusiformis*, streptococci, and coliform bacilli. There was remittent fever reaching 39·3° C. at times, and the prognosis seemed hopeless. Five injections of 1 c.cm. of this pus were given at five-day intervals. Small abscesses with the flora of the mother abscess developed at the sites of injection. The temperature fell to 37·1° C., the exploratory puncture of the lung no longer yielded pus, the X rays showed an ill-defined shadow in the position of the former abscess cavity, and the appearance of the child was most flourishing, her weight having increased from 7·9 to 9·2 kilos in less than two months. Dr. Makai is conducting further experiments with this treatment, and he has already found that if the aspirated pus is exposed to the quartz lamp for 15 minutes before injection or is chilled for half an hour, the responses of the organism are quite different. Dr. Makai has certainly made out a case for further investigation, but this will have to be very thorough as well as confirmatory of his findings before his treatment can be accepted at his own valuation.

THE MILNE TREATMENT OF SCARLET FEVER.

IN the correspondence columns Dr. A. H. G. Burton draws attention to the great practical significance of an article on the treatment of scarlet fever which appeared in our columns on Sept. 8th, wherein Dr. G. Gushue-Taylor courageously recanted a theory of which he had been one of the principal advocates. The figures given in proof of recantation were striking, if not absolutely convincing. The fact that seems to us to rob the observations of final proof is that the figures giving the effect of return to the principle of isolation (Table A) are derived from a single year only, and from a year in which the incidence of scarlet fever was somewhat low. Figures over several years, including one in which the incidence was considerable, would carry conviction. In the same table it is noticeable that in 1920, with a total of 50 cases, there were only four return cases, a figure which is remarkably low if the eucalyptus treatment is really valueless. Nevertheless, it now seems highly probable that the facts reported by the late Dr. R. Milne are explicable on ordinary epidemiological principles. Prolonged isolation is a serious problem from educational and economic points of view, even if our experts are coming to the conclusion that mild uncomplicated cases of scarlet fever may be safely discharged at the end of four weeks; and we can only regret that Dr. Gushue-Taylor has been driven to abandon what appeared to be a hopeful alternative treatment. Nor can we feel that his remarks on the more efficient treatment of nasopharyngeal complications are very helpful, for inhalation of friar's balsam does not appear of much preventive value in other infections, and he throws no new light on the difficult choice of which tonsils to condemn and enucleate. Before resigning ourselves to the cumbersome protection of prolonged isolation, we may hope that medical officers of health, with Dr. Gushue-Taylor's admirable spirit of inquiry and progress, will make further trial with other local disinfectants such as chloramine-T.

THE REGISTRAR-GENERAL'S REPORT FOR 1921.

WE complete this week a brief summary of the concluding volume of the annual report of the Registrar-General for 1921, a report which calls for detailed study by all who wish to keep abreast of the progress of medicine in our own times. We have already singled out for special notice the section in which the writer, presumably Dr. T. H. C. Stevenson, whose name is not mentioned, illuminates the relation of tubercle to infantile mortality. This week we reproduce two charts, one of which illustrates recent remarkable changes in the age-incidence of mortality from influenza, the other the equally striking changes in that from cancer. Now that the whole "Review" (as it is now called) for 1921 has appeared it is the time to return to a consideration of the new format. The present volume is, we freely admit, handy in form and comparatively light, but further experience has not decreased our repugnance to the cramped page and the minute figures in which the tables of Parts I. and II. are printed. The change must seriously increase the difficulties of study except to the myope. It is also a hardship to the student of statistics that long months have elapsed between the publication of the tables and the text; possibly in the future a shorter interval between the three parts will be secured. The substance of the report is so well worth study that no pains would be wasted in enabling that study to be made with comfort and efficiency.

A STANDARD FOR MENTAL HOSPITALS.

ANY administrative change which would actually enforce a certain standard of treatment in mental hospitals would probably benefit the insane as a whole, provided that it carried no disadvantages in other directions. It is well known that this standard at present varies widely, and the Board of Control has no powers of enforcing changes in an institution presenting unsatisfactory features, unless a case of cruelty to a patient is proved, beyond declining to sanction transfers, a step which would be quite indifferent to the committee of the average county hospital. "Nationalisation" of mental hospitals, as suggested by Dr. A. T. W. Forrester in another column, would achieve a uniform standard of treatment, and at the same time enable the existing buildings so to be utilised as to afford separate and efficient treatment to recoverable cases. But if this "service" were made as efficient as possible, if all the varied and necessary equipment were provided, and an adequate staff paid at rates which would attract the "young, active, progressive, and best qualified members" of the medical profession (and, correspondingly, qualified recruits to the nursing profession), if, in fact, all that needs to be done were done, this service would cost not less but far more than the present cost of maintenance of the asylums. Money is the obstacle to these improvements; no one has ever suggested before that more could be done with the present expenditure of eight millions per annum; mental hospital committees, who, incidentally, work gratuitously, cannot often be accused of wasteful expenditure.

The main objection which we have to a State service is one which applies to the State management of any concern—namely, that it hampers originality and enterprise. A keen medical superintendent anxious to adopt a new form of treatment might have his scheme held up for years either on the score of expense or because some bureaucrat disagreed with or misunderstood the underlying hypothesis. At the same time some of the smaller, and in particular the private, mental hospitals would be apt to lose their traditions and individual character—assets of no small value. Outside local bodies who interest themselves in the welfare of asylum patients in a dozen different ways would feel their responsibility lessened, and much valuable work of this kind might be dropped. Dr. Forrester's forecast of uniform clothing is alarming in itself. Nationalisation should be possible without this sort of inhuman standardisation.

A CENTRAL MEDICAL INSTITUTE FOR PAISLEY.

THE medical officer of health of Paisley, Dr. G. V. T. McMichael, records in his annual report for 1922 a munificent offer. Miss Russell, of Muirfield, Paisley, intends to erect a central medical institute for the benefit of the mothers and children of the town as a memorial to her two brothers, the late Messrs. Robert and Thomas Russell. The institute, when erected, will accommodate all the various clinics conducted by the local and education authorities. Dr. McMichael pointed out in his 1921 report how severely the work of both authorities was handicapped by the hopeless inadequacy and unsuitability of the existing premises; so that no gift could have been more opportune. At the request of Miss Russell, Dr. McMichael and Dr. R. Donald, the chief school medical officer for Renfrewshire, have prepared a scheme which provides, in addition to the usual requirements of a maternity and child welfare centre, a tuberculosis dispensary and a school medical department, accommodation for clinics for minor ailments, dentistry, and eye, ear, nose, and throat affections, a remedial department for deformities, an X ray department and a disinfecting clinic for dealing with verminous children. Dr. McMichael points out the obvious advantages, from the point of view of convenience, economy, and avoidance of overlapping, in having all these clinics concentrated under one roof. A joint committee of the local and education authorities has been appointed to consider the whole question of coördination of the work. Miss Russell has approved the scheme as outlined and has appointed her architects. An ideal central site has been secured, the building will be begun without delay, and when completed and fully equipped will be handed over to the health authority, free of all cost. Paisley will be envied by other towns for being able to claim as its citizen a woman of Miss Russell's vision and generosity. Her gift is well timed in these days when public health work is hampered by lack of funds. It is also especially appropriate at a time when there is a widespread desire to secure a better coördination of the medical services employed by the various local governing bodies.

DISTRIBUTION OF ACROMEGALIC STIGMATA.

Lenz[1] recalls that while acromegaly affects several different kinds of tissue, it affects only one kind of locality in the body, for the fingers, toes, chin, nose, and ears are all distal parts. Now a very similarly distributed occurrence, not of local overgrowth but of pigment, is to be observed in one or two breeds of domestic animals, notably in a kind of rabbit called by continental fanciers "Russian," although not connected with that country. These animals are albinotic except for black ears, muzzle, paws, and tail—which parts have also a lower temperature than the rest of the body, the dividing line in the case of the ears being very sharp, for the auricle at its insertion is warm, while a millimetre or two higher up, just where the black pigment begins, it is markedly cooler. The author cites a number of experiments, illustrated by photographs, from which he deduces that the lower temperature is indeed productive of the pigmentation. If in winter time some white hair were removed from the back, the new growth was pigmented, and least so at the edges of the denuded area, where the surrounding hair might be expected to afford some protection from the cold. If summer were chosen for the experiment, the new hair showed less pigment, and particularly at the roots, where again there would be most protection from the cold; moreover, in summer the new pigmentation was not permanent, its disappearance beginning at the edges of the patch. The critical skin temperature, below which pigmentation followed, seemed to be about 25° C.; and Lenz mentions that certain ferments, such as might be concerned in bringing about pigmentation, are active only below a certain temperature. Some confirmatory circumstances are next adduced. The new-born rabbits, which, of course, in the womb or in the nests are not exposed to cold, are nowhere pigmented. The characteristic pigmentation of distal parts increases in winter and decreases in summer. Small and weakly animals showed it best. Conformably with this, breeders recommended keeping the animals in unheated hutches; moreover, the whole breed was very small and delicate, as might be expected, for clearly it was being selected for cold extremities, and so for a weak blood circulation. The peculiar "Russian" marking, to be seen in a breed of guinea-pigs and of cats (Siamese) as well as in rabbits, probably depends then upon incapacity to form pigment in presence of a temperature higher than 25° C. For this same reason—namely, that they have the weakest blood circulation and therefore the lowest temperature—may the distal parts be chosen for dysharmonic growth in human acromegaly. The essential cause is, of course, an over-functioning of the hypophysis; but its hormone may be more active at a temperature rather below that of the central parts of the body. It is also conceivable that one of the functions of this gland is to stimulate metabolism at low temperatures, for the northern European races are of more acromegalic aspect than the southern ones. This is, of course, in accordance with the view of racial characters being dependent upon endocrine influence. The suggestion is made that a desirable experiment would be for an early acromegalic subject to wear continuously a warm glove on one hand only, to see if this hand showed difference in growth from the other one.

BOARD OF CONTROL: ANNUAL REPORT.

THE ninth annual report of the Board of Control, besides providing interesting statistics, surveys as usual the events of the year (1922) in connexion with the treatment of the insane and the mentally deficient. Most of these events have already been chronicled and discussed in our columns, and it remains to congratulate the Board on their progressive attitude, their tolerance of criticism, and their manifest anxiety to use interest, when it appears even as adverse judgment, to better the conditions under which the insane are detained. It is admitted that there are many directions in which improvement is possible in the way of prevention and of cure, but it is emphasised throughout that improvements and developments must involve increased expenditure, the incurring of which the community must be prepared to sanction. If the result of agitation is to arouse in the mind of the public a permanent and not a merely fitful and evanescent interest in the welfare of those suffering from mental disorders much good may result. Some few reforms are not dependent on outlay and are being actively encouraged—for example, permission to a patient to wear his own clothing, or at least to retain the same suits, dresses, or boots when transferred to another ward.

In discussing the annual report for the year 1920, we deprecated the small amount of space devoted to an account of the research work done in mental hospitals. This year a supplement of 25 pages summarises scientific work accomplished and in progress at 12 institutions, ranging from work on the ætiology and pathology of obscure diseases to comparative studies in different methods of treatment, including the inoculation of malaria parasites in the attempt to influence general paralysis of the insane. Future research is to be even more extensive. The establishment of the Birmingham Joint Board of Research, under the directorship of Sir Frederick Mott, into the causes of mental disorder is viewed with favour by the Board, who announce their hope that corresponding research centres will be instituted in connexion with each university in England and Wales, and that with each of these centres will be grouped and affiliated every neighbouring institution in which mental cases are received. The function of these centres should be research, and should include such investigations as cannot properly be undertaken in a small clinical laboratory. This latter provision now exists in a considerable number of mental hospitals, but by no means in all of them, and it is the strong view of the Board that no mental hospital should be without one. Work should be systematically prosecuted in these laboratories, not only supplementary to post-mortem examinations, but in aid of routine clinical investigation. Further, with the institution of research centres, the Board hope to see the development of mutual coördination between them whereby interchange of information would be facilitated, results usefully compared, and needless duplication of effort avoided.

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[1] F. Lenz: Archiv für Rassen- und Gesellschafts-Biologie, Bd. xv., H. 1, S. 24.

LONDON MEDICAL EXHIBITION.

ON Oct. 1st, and during the four days following, the fifth London Medical Exhibition to be held since the war will occupy the Central Hall, Westminster. We understand that the promoters have taken pains to assemble all the most modern developments in scientific appliances, preparations, and publications likely to be of interest to the medical world. The exhibition thus represents the outcome of scientific research brought into the realm of practical utility by commercial enterprise. It is a far cry to the time when the physician digged his own herb-garden and his medical books were family heirlooms; to-day commerce has advanced hand in hand with science, and we owe it in no small measure to the great medical and surgical houses that modern medicine has reached its present high level of practical achievement. The large number of doctors, not only from the metropolis, but from all parts of the world, who in past years have visited the exhibition has definitely established the value of this undertaking. The fact that the general public is rigidly excluded refutes any suggestion that this exhibition is run for trade purposes alone; experience in the past has shown that the benefits accruing to trade and profession have been mutual. It is of importance to a practitioner that he should be familiar with the products of those firms that cater for his requirements—both in his own interests and in those of his patients. The exhibition affords an opportunity to taste, see, and handle which can be had so easily and so conveniently in no other way.

Sir Archibald Garrod has been appointed to serve on the Medical Research Council to replace Prof. F. Gowland Hopkins, who retires under the provisions governing the rotation of membership.

ROYAL SANITARY INSTITUTE.—A sessional meeting will be held on Oct. 12th and 13th in the Town Hall, Carlisle, commencing on Friday at 7.30 P.M., when a discussion will take place on "Public Health Administration of Measles and Whooping Cough, from the points of view of a County Borough and a County Area," to be opened by Dr. J. Beard and Dr. F. H. Morison, Dr. T. Eustace Hill presiding. A discussion on "Some Aspects of Housing in Carlisle" will be opened by Mr. Percy Dalton, followed by Mr. A. Horsburgh Campbell, Dr. A. K. Chalmers, Dr. Kenneth Fraser, Dr. G. W. N. Joseph, Dr. Harold Kerr, Dr. E. W. Rees-Jones, Dr. J. E. Spence, Dr. J. T. Wilson, and others. On Oct. 13th visits will be paid to various works in the neighbourhood.

Modern Technique in Treatment.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

XXXVIII.

THE TREATMENT OF GLYCOSURIA IN PREGNANCY.

THE urine of a pregnant woman should always be examined at intervals, since albumin or sugar may be present in the urine some considerable time before any other signs or symptoms appear. Fehling's test is generally used for sugar, though it is not very delicate and may give rise to error. The error may be due to (1) bad Fehling's solution, since if the two solutions A and B are mixed, and then kept for a long time, the solution may reduce itself when it is boiled; (2) the presence of other substances, such as creatinine, uric acid, and glycuronic acid, which reduce Fehling's solution. Thus a positive test with Fehling's solution must be confirmed by other tests. The simplest of these is Benedict's, which is gradually replacing Fehling's for clinical work, as it is more reliable and gives very little more trouble; 5 c.cm., or 90 minims, of Benedict's solution and 10 drops of urine (as measured with a dropper) are boiled together. If dextrose is present in a concentration of over 0·5 per cent. there will be a precipitate in about 30 seconds after the onset of boiling, but to make certain the mixture should be boiled for two minutes. If the solution remains quite blue it means that sugar is present in a concentration of less than 0·1 per cent.; if the colour turns green it means that there is more than 0·1 per cent. present. Instead of boiling for two minutes over the flame, the test tube, after the solution has been well mixed, may be placed in boiling water for five minutes, which is perhaps an easier method for a busy practitioner.

Differential Diagnosis of the Reducing Substance.

A positive Benedict's test does not necessarily mean that dextrose is the reducing substance present in the urine, since (1) lactose, (2) lævulose, (3) a pentose, (4) homogentisic acid all give a positive test. (3) and (4) are very rare, but (1) and (2) must always be considered; the distinction between these requires some knowledge of chemistry.

Lactose may be present in the urine of a pregnant woman as soon as the breasts show signs of activity, but is usually only present (*a*) in the last weeks of a pregnancy; (*b*) after the child has been born; (*c*) if the lactation has been abruptly checked. Lactose is not fermented by yeast, and it is further distinguished by the difficulty of preparing the osazone crystals by heating with phenyl hydrazine and potassium acetate. The crystals, if formed, differ in many respects from those of glucosazone. Lactosuria is a harmless condition, which will pass away when lactation comes to an end, and demands no treatment.

Lævulose is present in the urine under certain conditions. (1) If the liver is seriously damaged, as in acute yellow atrophy of the liver, poisoning with salvarsan, or trinitro-toluene. Lævulose is often used as a test for the condition of the liver, since it may be excreted in the urine after a dose of 25 g. of lævulose. It is better to estimate the amount of sugar in the blood after the dose of lævulose, since, if it is raised at all, it is probable that the liver is considerably damaged. (2) Lævulose may be present under conditions which have no known pathological importance, and may be excreted for years without any symptoms. (3) It may be present during pregnancy; Cammidge has found that in 25 per cent. of cases, when a reducing substance is present in the urine of pregnant women, it proves to be lævulose. Lævulose reduces Fehling's and Benedict's solutions, is fermented by yeast, and gives osazone crystals which are identical with those of dextrosazone. It can therefore be distinguished from dextrose only by the fact that it rotates the plane of polarised light to the left. This test can only be made with the aid of a polarimeter. If lævulose is present in the urine during the course of a pregnancy the question of serious damage to the liver should be carefully considered, but if there is no evidence of this it is probable that the lævulosuria has no significance and the condition can be safely neglected.

Significance of Dextrose in Urine.—When it has been proved that the reducing substance in the urine is dextrose it does not follow that the patient is suffering from diabetes mellitus. Any of the following conditions may cause dextrose to appear in the urine: (1) exophthalmic goitre, (2) acromegaly, (3) renal glycosuria, (4) temporary diminution of sugar tolerance, (5) true diabetes mellitus. Exophthalmic goitre and acromegaly can easily be diagnosed and need not be further considered.

Renal Glycosuria.

With the knowledge gained from the estimation of the sugar in the blood, it has been realised that dextrose may be excreted in the urine without there being any increase in the amount of sugar in the blood, and therefore no diminution in the sugar tolerance. This condition is termed a renal glycosuria, and it is believed that the threshold of the kidney—i.e., the point at which sugar is excreted in the urine—is lower than in normal persons. This condition occurs in from 0·1 to 1 per cent. of the population, and is usually only discovered by accident, as the patients do not have any of the ordinary symptoms of diabetes mellitus. The diagnosis may be suspected from the history of the discovery of the sugar and the absence of any symptoms, but can only be made with certainty if an estimation of the blood-sugar is made at half-hour intervals after a dose of 25–50 g. of dextrose. The blood-sugar curve will resemble that of a healthy person who has a normal sugar tolerance, in that it will not rise above 0·18 or 0·19 per cent. at the end of half an hour and will have returned to normal after one, two, or three hours. Sugar, however, will be excreted in the urine in amounts of 1 to 4 g. (15–60 gr.) per hour by the patient who has a renal glycosuria. Some patients with a renal glycosuria excrete sugar when the blood-sugar is quite normal—i.e., 0·08 per cent.—while others do not begin to excrete sugar until it has risen above 0·13 per cent. or so. The diagnosis can be clinched by adding definite amounts of bread, 4, 8, 16 oz., on successive days and estimating the amount of sugar excreted. A patient with renal glycosuria will excrete very little more sugar after the 16 oz. than after the 4 oz. of bread. The total amount of sugar will vary in different cases from 5 to 30 g. (75–450 gr.). Once the diagnosis has been made the patient does not require any treatment, and may eat ordinary food. Several women who have had a renal glycosuria for many years have borne children without suffering any ill-effects, and the children do not necessarily have a renal glycosuria, although this is often the case. It has recently been shown that a renal glycosuria may be caused by pregnancy, since the threshold of the kidney for dextrose is altered during pregnancy. Sugar may be excreted in the urine, although the sugar tolerance is normal, and the blood-sugar does not rise above the normal limits. The amounts of sugar which are excreted are small, and usually only appear after a large dose of sugar—i.e., 100 g.—has been given. The correct diagnosis may be suspected from the complete absence of symptoms and the small amount of sugar which is excreted, and can be established by estimating the blood-sugar. The condition requires no treatment.

Temporary Diminution of Sugar Tolerance.

In all the conditions hitherto described there has been no reduction of sugar tolerance, but a certain number of pregnant women do develop this. The actual amount of sugar which is excreted is not large—10, 30, or 50 g. in the day. These amounts are either the same or a little larger than those excreted by patients with a renal glycosuria, so that the diagnosis cannot be made by examination of the urine. It can only be made with certainty by estimating the blood-sugar at intervals after a dose of 25 or 50 g. of dextrose. If there is a diminution of sugar tolerance the blood-sugar, half an hour after the sugar was taken, will be either already above 0·20 or quite close to this point; at the end of one hour the blood-sugar will be above 0·20, and will not have returned to normal at the end of two hours, or perhaps three or four hours. Such a curve is typical of a diminution of sugar tolerance; some information can be obtained by estimating the blood-sugar at the end of one hour only, since if the blood-sugar is above 0·20 at this point there is a diminution of sugar tolerance. The urine before the test may not contain any sugar although the blood-sugar is normal, but since many patients who are pregnant are believed to have a lowered threshold for sugar, there may be a coexisting renal glycosuria. The course which the condition runs is almost invariably favourable, since after the child is born the sugar disappears from the urine; it may reappear during the next pregnancy. The patient will need careful watching; the total output of sugar should be estimated and the carbohydrate intake reduced to a definite amount, say 4 oz. of bread. If the output of sugar is reduced to about 10 g. this reduction is probably sufficient, especially if the blood-sugar when fasting is normal, since there may be a coexisting renal glycosuria. If there is little reduction in the output it is wiser to adopt more drastic measures and starve the patient for one or two days in order to get rid of the sugar from the urine. The diet should then be gradually increased according to any of the modern methods used in the treatment of patients with diabetes mellitus. If the sugar remains absent, or is very small in amount, cautious increase in the starch food may be made: 1 oz. of bread is added every second day up to 4 oz. This procedure may be modified if insulin is used; it is probable that 5 or 10 units of insulin will enable these patients to eat moderate amounts of bread without passing any sugar, or only a trace. When the urine contains no sugar treatment should be controlled by an occasional blood-sugar estimation.

True Diabetes Mellitus.

In all the conditions so far described the patient will not complain of symptoms ascribable to diabetes mellitus, and the sugar will usually be discovered by accident. A certain number of patients do, however, develop true diabetes mellitus, and it is the fear of this complication which makes the periodical examination of urine during pregnancy important. Patients with a severe form of the disease will complain of thirst, weakness, &c., and the diagnosis will be made because the patient consults her doctor for these symptoms. But patients with a mild form of the disease may not complain of any special symptom at first, and the diagnosis may only be made in the course of a routine examination. Once it is confirmed the patient must have the full régime of diabetic treatment with periods of starvation in order to keep the urine sugar-free and the blood-sugar normal. Here insulin will alter the accepted treatment considerably, since the starvation will probably be much abbreviated, if, indeed, it proves necessary. The question whether the pregnancy should be allowed to continue, or should be terminated, must be carefully weighed. It depends to some extent on whether the patient is near term. If she is near term it is better to treat the diabetes energetically and allow the pregnancy to continue normally. If, however, the disease has started early in the pregnancy it may be wiser to terminate it. All these statements depend on the severity of the attack and the response to treatment. The influence which insulin will play is probably considerable, and no pregnancy should be terminated without very careful consideration.

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Special Articles.

STUDIES ON THE PNEUMOCOCCUS.

TWELVE months ago we reviewed in these columns[1] a report from the Ministry of Health by Drs. F. Griffith and A. Eastwood[2] on the pneumococcus. The work detailed in this report has now been followed up by a further inquiry on the same subject by these two workers[3] prefaced by an introduction by Sir George Newman. In the first section on the influence of immune serum on the biological properties of pneumococci, Dr. Griffith takes as his starting-point the old conception of a pure culture of a bacterium as consisting of a number of absolutely identical individuals. This conception he considers to be erroneous and quotes in support of his view the recent work of Arkwright and of Benians on *B. dysenteriæ* and of Mary Cowan on the streptococci. Practically all recent work, in fact, emphasises this point—viz., that bacterial variation in a pure culture is distinguishable without there being any suggestion of a true transmutation of bacterial species. In other words, in spite of variation the pneumococcus is still a pneumococcus and not a staphylococcus or other organism. By growing different serological types of pneumococci in immune serum Dr. Griffith shows that when these types are cultivated on homologous serum, growth takes place in the form of clumps and long chains or gelatinous balls which deposit at the bottom of the tube; and that when this primary culture is shaken and plated, in addition to the normal type of colony, there appears on the plate subculture a variable number of colonies of size, appearance, and consistency different from the normal colony. The normal type of colony is referred to as S and the variant as R. A second passage through serum culture yields a larger number of variants from the normal, and a third passage finds the normal S form replaced by the R variant forms. Finally, after suitable subculture a stage is reached at which a single colony culture of either type, with some exceptions, breeds true. The normal S type of colony is circular and dome-shaped, with a smooth, shiny surface and an almost watery consistency. The variant or R type is a rough type of colony, dull or finely granular, and more coherent than the normal type. At first, also, the rough variant is generally smaller than the smooth normal colony. Both are equally bile-soluble. These changes, it should be borne in mind, are all produced by growing the serological types of pneumococci in cultures of homologous serum; heterologous sera appear generally to have no power of producing the rough variant colony from the smooth normal. The latter remain stable if kept virulent by passage through animals and growth in blood broth, whereas a rough variant after retaining its characters for many generations on blood broth may revert subsequently to the smooth type. Again, the smooth normal colony culture remains pathogenic for mice, whereas the rough variant shows a high degree of attenuation. Dr. Griffith quotes a smooth type killing in 0·000,000,01 c.cm. of broth culture and a rough variant from the same original strain having no effect in a dose of 0·2 c.cm. Finally, these two types of colony are shown to have different antigenic qualities. The S type produces in young broth cultures a soluble substance which the R colony does not, the former agglutinates with specific serum with a firm gelatinous precipitate, the latter produces loose clumps which are readily shaken up, whilst other immunological distinctions (e.g., with absorption) are also noted.

Dr. Griffith points out that here we have a definite morphological criterion for distinguishing between virulent and attenuated strains, and that immune sera should always be prepared entirely from S type cultures. The alteration from the S to the R type he considers to be a degenerative tendency present in many bacterial strains, and is therefore consonant with the work of other observers quoted at the beginning of our review. The S and R types possess related antigens but R lacks an antigen contained in S; witness the results obtained in absorption experiments. The author believes that an explanation of these phenomena can be found in the intimate association of the pneumococcus capsule with the existence of virulence. Briefly it is the outer portion of the pneumococcus which is modified in the change from smooth to rough type of colony—hence the latter loses the typical smooth, shiny surface and watery consistency and becomes dull and granular, whilst the individual cocci tend to adhere. This modification, it is suggested, is due to a substance soluble in salt solution which is not secreted in the attenuated R type of colony and which is intimately concerned with the virulence and capsule formation of the S type.

In the second part of this report Dr. Arthur Eastwood discusses the questions raised by his colleague's work of bacterial variation and transmissible autolysis and the relation of bacterial enzymes to bacterial structures. He points out that bacterial variation is no mere haphazard quality, but that it tends always to some one definite direction, and he shows how in the process of reproduction aberrant or variant forms may conceivably, on theoretical grounds, occur. Thus the transmissible lytic substance of the Twort-d'Hérelle phenomenon is not merely an agent for destroying bacteria but a method of producing bacterial variants. We are thus faced with the biological problems of variation and reversion to type, probably intimately bound up with questions of virulence. Dr. Eastwood sums up a most interesting and thoughtful memorandum by formulating a general statement that the constituents of living protoplasm have two functions: (1) a catalytic action which prepares food material by means of appropriate enzymes, and (2) a synthetic action by which new protoplasm is built up. He suggests that the balance between these two functions may be very finely adjusted and any disturbance of it may lead to the production of bacterial variants.

The Medical Research Council Report.

This report has now been succeeded by one from the Medical Research Council[4] which approaches the pneumococcus from the standpoint of the clinical pathologist, and the two together make a valuable study of this organism, pointing the way to the solution of many bacteriological and clinical problems which have hitherto made this subject the battleground of many inconclusive struggles. The first part of the report of Dr. E. E. Glynn and Miss Lettice Digby is concerned with laboratory technique in which the various modern methods of investigation are detailed—and their name is legion. No good purpose would be served by reviewing these in detail, but we believe the authors have maintained throughout a well-balanced perspective. We would, for our part, heartily endorse their opinion that bacteriologists, as a rule, make far too little use of low-power binocular lenses for plating and culture work generally. Bile solubility also is better tested with deoxycholate than with whole ox bile and can be controlled more readily with the microscope. We also confess to a deep sigh of relief to find that sugar fermentation tests are relegated to a relatively subordinate position. En passant it is becoming more and more urgently necessary for bacteriologists to agree on a more or less standardised method for estimating hæmolysis of blood media. But these are merely technical points, and for most readers the main interest of the report will lie in fresh light it throws on the various bacteriological aspects of pneumonia; 140 cases of pneumonia and 50 of acute empyema were investigated by the authors, as well as saliva from normal controls and a group of miscellaneous pneumococcal and streptococcal infections. The authors found that in the case of sputum or saliva the mouse inoculation test yielded the most certain results for the finding of pneumococci, whilst streptococci, on the other hand, usually came out best on direct plate cultures. Lung-juice cultures obtained by means of exploratory puncture with a 10 c.cm. record syringe and a medium needle are advocated as a safe and valuable aid to diagnosis. In adults 45·1 per cent. and in children 61·5 per cent. examined in this way yielded positive results and afforded a reliable guide as to clinical prognosis, the mortality amongst positive cases being 50 per cent., as against 9·1 per cent. in the negative cases. The blood culture findings were equally striking, 45 per cent. showing positive results with a mortality of 71·4 per cent. in the positives and 8·3 per cent. in the negatives. The authors also isolated 23 strains of intermediate pneumo-streptococcal strains. Most of these were eventually assigned to one or other group but five strains remained definitely unclassifiable, their colonies being intermediate in character, their morphology generally diplococcal in serum broth and other crucial tests equivocal. These so-called intermediate pneumo-streptococcal strains are a source of much confusion in all bacteriological investigations made via the mouth, and chronically enlarged tonsils in our experience are particularly liable to harbour them. It is interesting to note that in the report under consideration a larger number of these intermediate types were ultimately classified as pneumococci then as streptococci. Whether or not we are encountering here the question of bacterial variation it is impossible at present to say, but the question is worthy of detailed investigation.

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[1] THE LANCET, 1922, ii., 623.

[2] Reports on Public Health and Medical Subjects. No. 13. H.M. Stationery Office. 1922. 2*s.* 6*d.*

[3] Reports on Public Health and Medical Subjects. No. 18. H.M. Stationery Office. 1923. 1*s.*

[4] Bacteriological and Clinical Observations on Pneumonia and Empyemata, with special reference to the Pneumococcus and to Serum Treatment. By Ernest E. Glynn, F.R.C.P., and Lettice Digby. Published for Medical Research Council by H.M. Stationery Office. 1923. 5*s.*

Space does not admit of a discussion of the various points raised with reference to the typing of the pneumococci, the classification of streptococci, and the identification of the numerous other organisms isolated from these pneumonia, empyema, and miscellaneous infections, but the question of clinical and bacteriological correlation cannot be passed over. In the empyemata of young children the Type I. pneumococcus cases were more often secondary to pneumonia than the Group IV. pneumococcus and the streptococcus cases. Also on the average the Type I. pneumococcus cases had a higher temperature and in the recoveries a shorter illness than the others. Amongst the pneumococcal pneumonias onset with rigor and termination by crisis was commoner with the Type I. cases than with Group IV. cases, whilst the temperature of Type I. cases was of shorter duration, more often continuous, and the sputum more often rusty than in Group IV. cases. It would seem, therefore, that Type I. pneumococcus produced the more typical clinical type of case, and this may not be without bearing on the larger bacteriological issue when we consider the fact that Group IV. pneumococcus is such a heterogeneous collection. It was also further noted that cases beginning with rigor had a heavier plate incidence of pneumococci than those whose onset was gradual. We cannot but regard this correlation of clinical and bacteriological findings as extremely valuable, as it is by means such as these that diagnosis becomes an accurate business. Indeed, reviewing these and other acute infective diseases of known bacterial origin we should say that the most notable advances made of recent years have been in the direction of rendering diagnosis more accurate, and in the long run more efficient treatment must surely follow. The authors of this report conclude by pointing out that the mortality from pneumonia, excluding influenza, is slowly increasing in England and Wales and is now greater than that from phthisis. To quote their concluding sentence: "A systematic investigation, by standardised methods, at a few centres in Great Britain, of the flora of normal mouths and of bronchitic and pneumonic sputa would furnish valuable information regarding factors governing the incidence of, and mortality from, pneumonia and influenza."

VITAL STATISTICS FOR 1921.

THE REGISTRAR-GENERAL'S REVIEW.

(*Continued from p. 582.*)

Causes of Death.—The first causes of death considered in the Review are the acute infectious diseases. Among these *enteric fever* is rapidly becoming a disappearing disease. In 1921 it was responsible for only 613 deaths, as compared, for instance, with nearly nine times this number in 1890 in a much smaller population. The death-rate in 1921 was only 16 and in 1920 was only 14 per million of population, the lowest figures hitherto attained. It was much higher in the north of England than elsewhere, and, strangely enough, was slightly higher in the aggregate rural districts than in London.

Fatality of Certain Infectious Diseases.—On page 40 is an interesting table showing the case-mortality of some of the chief infectious diseases. The rates are given with reserve, owing to possible defects of notification, and because in the case of small-pox the number of cases is too small to have significant rates based on them. Between 1911 and 1921 the case mortality of enteric fever varied between 15·8 and 20·6 per cent., of scarlet fever between 0·95 and 2·0 per cent., of diphtheria between 7·2 and 10·9 per cent., while that of small-pox (subject to the above-mentioned warning) varied from 1·6 to 42·9 per cent. The corresponding percentages for poliomyelitis and meningococcal meningitis indicate defective notification of cases.

Measles.—The figures for measles are regarded in the Review as indicating the possibility that "a new era in this disease may have opened." Stated in terms of the population at ages under 15 years, the death-rate from measles in 1921 was 206 per million, and the rate in 1920 was less than half the rate for any year prior to 1916. (To pursue this comparison another volume than the one under review needs to be consulted; the result only is stated in this volume.) For two years in alternation the death-rate from this disease has been unprecedentedly low, with a low rate between these two years. It may be hoped that increased attention to child life and the growing efforts to visit and nurse cases of this disease are beginning to show their effect.

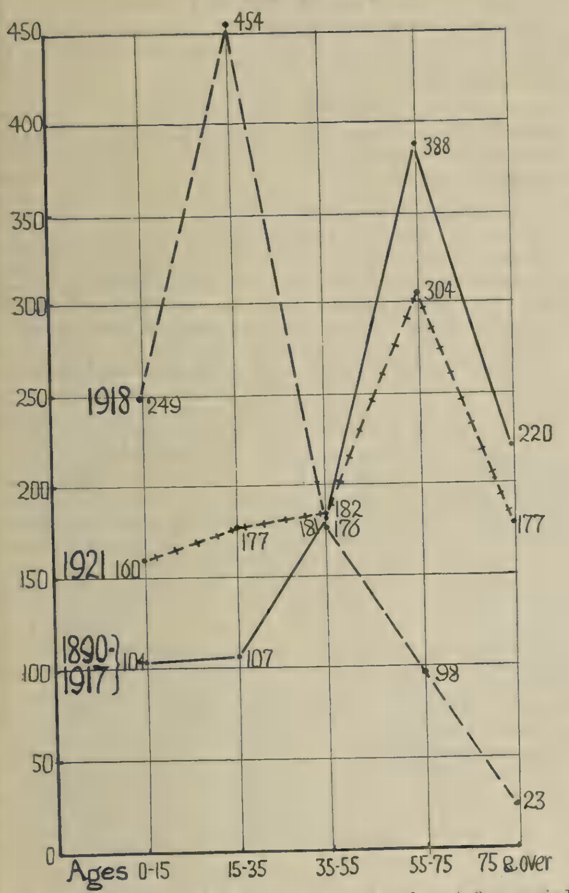
Scarlet fever has become a relatively innocent disease, so far as concerns death. In London it was prevalent three to four times as much as in rural districts, with a rather lower fatality.

Diphtheria shows much activity. From 1891–95 to 1911–15 it had declined, but this process has now ceased.

Influenza.—This disease at the outset of the great epidemic of 1918 underwent a sudden and remarkable change in the age incidence of its death-rate which has not been satisfactorily explained, and which, owing to its international distribution, can only be partially elucidated by the events of the great war. Although this cannot be discussed here, it is important to note, as shown in the following diagram, that the age distribution of influenzal mortality is steadily reverting towards the earlier type. In Fig. 1 the proportions of deaths at five periods of life are given for 1890–1917, for 1918, and for 1921, for females only, to permit of comparisons during the war, and standardised for age distribution. The extraordinary change in age incidence of mortality in 1918 is seen, and the reversion towards the earlier type in 1921.

Decline of Mortality from Tuberculosis.—This section contains the most complete review of the historical course of the death-rate from total tuberculosis, and from pulmonary and from non-pulmonary tuberculosis in this country which has hitherto been published. The death-rates from each of these forms of tuberculosis are given and the death-rates at all ages in the aggregate are standardised; in this way the differences due to varying proportions of

FIG. 1.



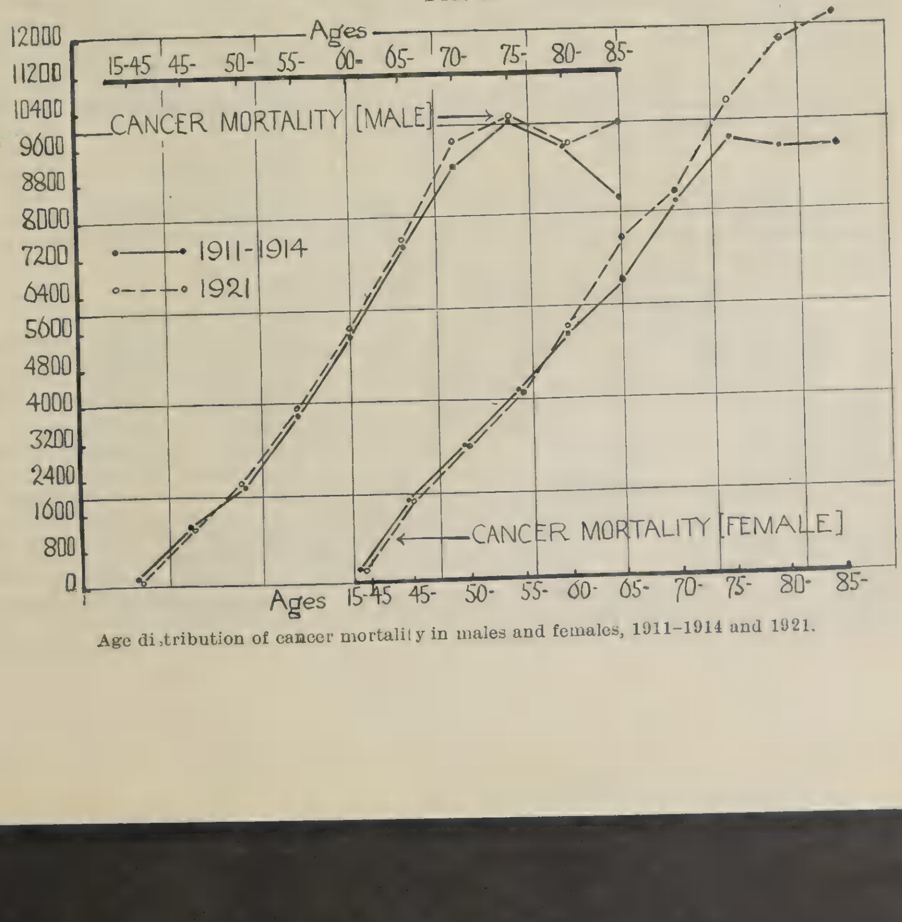
Proportions of deaths from influenza of females at five periods of life during 1890–1917, 1918, and 1921.

persons living at various ages being eliminated. Death-rates are given for each year from 1851 onwards, and summarised death-rates for decennial and for quinquennial periods. Attention was drawn in a recent issue[1] to the difficulty in interpreting statistics of various forms of non-pulmonary tuberculosis in infancy. As a large part of non-pulmonary tuberculosis occurs in infancy, the figures for pulmonary tuberculosis must be regarded as on a higher plane of certitude than those for total tuberculosis. Even for pulmonary tuberculosis in certain years there may be divergences from the usual course of events. This was to an exceptional extent the case during the great war, and following that in the great influenza epidemic of 1918–19, when the falling death-rate from pulmonary tuberculosis was replaced by an increasing death-rate which reached its maximum in 1918. The special causes for this increase and its distribution in certain special age-periods are discussed in other official reports by Dr. Stevenson. Here we are concerned solely with the general course of events, which has been resumed now that the disturbances caused by war and by influenza have disappeared.

Curves for total tuberculosis, given in the Review, show a surprisingly constant decline during the whole period 1866–1914, and this position has been resumed in 1920 and 1921. This constancy, as is pointed out in the Review, is not in the rate of fall, which has been increasing, but in the actual amount of fall. To bring out this point the course of events is charted not only for actual rates, but also on a logarithmic scale, thus enabling changes in death-rates and in rates of fall to be readily compared. With pulmonary tuberculosis the trend of events for males has been similar to that for total tuberculosis, the rate of fall having been consistently on the increase, while for pulmonary tuberculosis in females a particularly rapid fall was experienced from 1890 to 1896, while since then there has been some falling off in the rate of decline.

The decline in the death-rate from tuberculosis may be regarded as the resultant of forces, some of which tend to increase and others to reduce it, and the fact that the rate of decline has not increased so rapidly as may have been anticipated in view of the active anti-tuberculosis measures of recent years, gives ground when duly considered for encouragement. Even a stationary death-rate from tuberculosis, having regard to the increasing complexity of modern life, to the great increase of human communications, to the replacement of country by town life, to the increase of indoor and sedentary as contrasted with outdoor occupations, might reasonably be regarded as evidence that the improved hygienic habits of the people, the diminished amount of indiscriminate spitting, the improved nutrition of the population, the more successful treatment of the disease, and the hospitalisation of a large proportion of advanced and acute cases, in conjunction, are telling on the total mass of the disease. But instead of a stationary death-rate, we find that the death-rate from tuberculosis continues to decline, and so far at an increasing rate. There is every reason therefore to pursue active measures on all known lines of prevention of treatment, while welcoming any advances in therapeutics or in preventive measures

FIG. 2.



Age distribution of cancer mortality in males and females, 1911–1914 and 1921.

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[1] THE LANCET, Sept. 15th, p. 575.

that experience or scientific research may render available.

Cancer.—This disease now bulks more heavily in the death returns than tuberculosis, 46,022 deaths—20,649 of males and 25,373 of females having been returned—as cancer, as compared with 42,678 from tuberculosis—22,899 of males and 19,779 of females. In Fig. 2 is shown the course of the age distribution of cancer mortality in males and females, and it will be seen that after 45 for males and 60 for females the rates for every age-group are higher in 1921 than in 1911–14, while below these ages they are lower.

The partial shifting of the stress of cancer mortality towards the latter end of life, which remains when all fallacy caused by the greater number of survivors at these ages has been eliminated, is not peculiar to English experience. In recent returns for New Zealand, for instance, attention, we are informed, has been drawn to this change.

Among other interesting details as to the distribution of cancer, special attention should be drawn to the remarkable differences in the incidence of fatal cancer of the genital organs according to marital condition. Standardised death-rates being unavailable for this comparison, the relative excess of deaths from cancer of each genital organ over that for deaths from all causes is given, according to age, and in married and widowed women as compared with single women. There is excessive mortality among the married from uterine cancer, occurring chiefly in the reproductive period, and reaching its maximum of 210 per cent. at ages 35–40. Along with this goes the fact that the uterus is the only important seat of primary cancer mortality in which cancer does not appear to be increasing, a result which might be expected, in view of the lowered birth-rate, if injuries in childbearing have any relation to excess of cancer. On the other hand, cancer of the ovaries and Fallopian tubes shows as great a predilection for single women as uterine cancer for the married, but this excess only slowly emerges during the childbearing period. So also with mammary cancer, the excess from this form of cancer in the unmarried increases rapidly after the childbearing period. The complete significance of these important facts will be better seen when it becomes practicable in a later report to give death-rates for each age-period and for each variety of cancer. That they will be found to have much bearing on preventive medicine cannot be doubted.

The entire report calls for detailed study by all who are interested in medicine, either in its curative or its preventive side.

THE MEETING OF THE BRITISH ASSOCIATION.

SECTION OF PHYSIOLOGY.

THE papers read at this section may be divided, for purposes of description, into three classes—medical, pure physiological, and theoretical. Prominence is given to the contents of the papers in accordance with this order, though a strict demarcation of subject-matter is not actually possible.

The presidential address by Prof. G. H. F. **NUTTALL**, F.R.S., dealt with Symbiosis in Animals and Plants, and naturally attracted a large audience of botanists. The address was very broad as well as deep, and does not lend itself to abstraction, as it was developed in considerable detail.

In a paper on the Relation between Diet and Cancer, Dr. S. **MONCKTON COPEMAN**, F.R.S., developed a hypothesis which rests on the idea that since cancer tissue is of juvenile type, and since fat-soluble A-vitamin is more essential for the nutriment of young than of adult tissues, that reduction of the vitamin-A content of the diet might exert some differential effect on the growing tumour.

Dealing with the subject of Dental Caries at Porto Santo, Dr. **MICHAEL C. GRABHAM** stated that the natives of this island are almost immune from caries, and suggests that this is due to some constituent of the highly mineralised water. The teeth of the district are characterised by the appearance of a thin yellow line across the upper incisors, and in later life this stain spreads and stains the teeth generally. It is, he said, not seen in Madeira.

Prof. J. M. **BEATTIE** dealt with the

Action of Finely-Divided Particles of Slate on Toxins.

The work started from the observation that workers in slate quarries did not suffer from rheumatism, although they often had bad teeth. It was an established fact that certain substances, such as asbestos, could destroy toxins *in vitro*, and extension of these experiments showed that the same property was possessed by finely-powdered slate, 2 g. of which could destroy 10 lethal doses of diphtheria toxin, if the slate was sufficiently finely divided. The action is effected in a few minutes, and the toxin is absent from the slate itself as well as from the supernatant fluid. Although other fine siliceous powders such as kieselguhr, clay or silica, can do the same thing, the presence of silica is not essential to the reaction, which can also be effected by a variety of other finely particulate substances such as charcoal, bismuth salts, &c. The use of these two last-named substances in dyspepsia is of interest, and it was suggested that by adsorbing the toxins, the bacteria were rendered inert and were more easily destroyed. Hæmagglutinin, agglutinin, and complement were also adsorbed by slate, and live bacteria mixed with slate dust were rendered non-lethal, in spite of the fact that live bacteria could still be recovered from the site of injection of the mixture. The antigenic power of serum was unaltered by slate, a fact which might perhaps find some further application, for it enables us to remove the toxic substances without destroying the antigenic properties.

Prof. H. E. **ROAF** described a method for

Measurement of Colour-Blindness in Terms of Wave-lengths,

which is certainly recommended by its simplicity. The subject is given a standard diagram in colours, which he is told to fill in on a blank; the diagram is then examined, together with the standard, by viewing them though coloured screens which cut off certain wave-lengths. When a match is found the deficiency of the patient's vision, as compared with the observer's, is given by the wave-lengths of light absorbed by the viewing screen which gives the match. Colour-blind subjects fell into three groups, of which the first was deficient at the red end, the second up to the sodium line of the spectrum, and the third up to the violet end—i.e., was totally colour-blind. Dr. F. W. **EDRIDGE-GREEN**, in a paper on the effect of the blood of the retina on colour matchings, pointed out that this must be allowed for in comparing colour matchings of foveal with marginal parts of the retina.

A most ingenious recording kata-thermometer, devised for Prof. L. **HILL** by Dr. E. **SCHUSTER**, was demonstrated by Mr. T. C. **ANGUS**. This instrument allows of a graphic record being made to show the rate of cooling in the air, and should prove very useful for the investigation of ventilation problems by the use of the kata-thermometer.

Prof. J. J. R. **MACLEOD**, of Toronto, gave a popular lecture on Insulin and its Value in Medicine,[1] which was attended by a large audience in the Picton Hall. Most of the subject-matter will be familiar to those interested in the subject, but it is worth mentioning that Prof. Macleod laid stress on two points of some current interest in connexion with recent claims. One is that there is at present no evidence that insulin can produce any of its effects when given by the mouth.

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[1] THE LANCET, Sept. 22nd, p. 591.

The other point is that since we do not know the exact chemical nature of insulin, except that it is a very complicated substance, any hopes of synthesising the principle are doomed to disappointment, at least for a long while to come.

Some Pure Physiology.

Papers of pure physiological interest comprised one by Prof. H. Zwaardemaker, of Utrecht, on Bioradioactivity, or the importance of potassium and other radioactive elements in the life of the cell, and one by Prof. R. Magnus, also of Utrecht, on the effect of carbon-dioxide on the lungs; he showed that carbon-dioxide in physiological concentrations, and in presence of extremely minute amounts of adrenalin, causes dilatation of the bronchioles and pulmonary vessels, thus facilitating the inlet of air and the circulation of blood through the lungs. Prof. Ramsden and collaborators read papers, and showed very pretty demonstrations dealing with various phenomena in physical chemistry. A somewhat similar subject was dealt with in a joint discussion with the Chemistry Section on the Physical Chemistry of Membranes in Relation to Physiological Science. The discussion was opened by Prof. Roaf, who gave an account of some important phenomena in physiology in which membranes played a part, or might possibly have to be considered as playing a part.

Prof. F. G. Donnan then gave an account of the physico-chemical aspect of membranes, and expressed the opinion that much of this part of physical chemistry had only a remote bearing on physiology, because in the past it had dealt with states of thermo-dynamic equilibrium. He said that the activities, and indeed the very existence, of a living organism depend on its continuous utilisation of an environment that is not in thermo-dynamic equilibrium. A living organism is a consumer and transformer of external free energy, and environmental equilibrium means non-activity and eventual death. It was, indeed, a pleasure to hear such a distinguished physical chemist express views so broad and so sympathetic to biology, and gave one to hope that the omniscience of the physical chemist is a thing of the past generation.

Other papers of pure physiological interest were contributed by Dr. S. C. Brooks on Electrolytic Conductance of Micro-organisms; Dr. W. W. Waller on Red Blood Corpuscles under the Microscope; Prof. C. Lovatt Evans on the Contraction of Plain Muscle; Prof. Roaf on the Mechanism of the Cochlea, and on the Oxygen Content of Methæmoglobin, which he, with Buckmaster, believes to be only half that of oxyhæmoglobin; Mr. J. C. Waller on Photo-electric Currents in Leaves; Prof. J. S. Macdonald, with Dr. F. A. Duffield, papers and a demonstration on the Energy Cost of Cycling; Prof. J. S. Macdonald, with Miss Margaret Macdonald, Mr. George Macdonald, and Dr. T. W. Wadsworth, on the Physiology of Walking. There was also a paper by Mr. Watson-Jones on the Metabolism of the Frog at Different Temperatures.

The meeting was well attended, the local arrangements were excellent, and on the whole it was the best meeting of the section held since the war.

SECTION OF ANTHROPOLOGY.

In this section the presidential address by Prof. P. L. Newberry showed that in the delta of the Nile, long before Menes, the first king of Upper and Lower Egypt, there had been a contact of races from Lybia on the one hand and Asia Minor on the other, with the autochthonous predynastic peoples. From this contact arose the Egyptian civilisation. Research is proceeding which may elucidate the relative importance of the various elements. In a further paper Prof. Newberry drew attention to the importance of studying the origin of the domesticated animals and plants found in Egypt. There were evidences that the cereals came from Syria, but many weeds seemed to come from farther East. The goat was probably responsible for the disappearance of the olive by eating the shoots of young plants, while the camel, by close cropping, drove away the antelopes, and so the carnivora who preyed on them. In the discussion Prof. G. Elliot Smith suggested that barley really came from Somaliland, and indicated an infiltration of civilisation from the south rather than the north. Further research is proposed, and any evidence of the nature of weeds associated with cereal crops might be of great assistance.

Prof. Sollas, of Oxford, read a paper on the evidences of Miocene Man, derived from certain flints from the province of Cantal in France, found in deposits of Pontic age on the rocks of the Miocene and Pliocene periods. In certain cases, as for example, in the Hastings beds at the base of the Eocene, erosion of underlying formations may lead to such pressure on flint pebbles that they flake in a manner similar to that produced by human agencies, and these flakes may deceive the very elect, but in this instance the formation was such that, so far as Prof. Sollas can see, all non-human agencies can be excluded. If true, this greatly extends the history of an intelligent precursor of homo sapiens on the earth, and goes far to confirm the views of Sir Arthur Keith.

Sir Arthur Evans gave an account of his recent work at Knossos, showing the origin of a road from the palace gates which passes to the south of the island, facing Africa, so that navigators could reach Africa without passing the dangerous capes at the ends of the island. This may explain the mutual relations of Minoan and Egyptian cultures, if not even some intermingling of races.

Dr. Kruyt described a stone-using people of Central Celebes, who erected menhirs to their dead and were acquainted with bronze. They preserved the bones of the dead in pots they named "vessels," indicating a former intention and perhaps practice of sending the dead home for burial. This has a bearing on the theories of race or culture dispersal from a point on the European border.

Mr. W. E. Armstrong pointed out that on Mossel Island there was a ceremonial consumption of one or more persons on the death of a chief. Sometimes the victim offers himself voluntarily; at other times force must be used or strangers used for the purpose. There is also a peculiar form of pseudo-marriage, in which a woman, owned by several men unable individually to support a wife, is let out on hire on festive occasions for the benefit of the partners.

Mr. W. Bonser, in a study of the magic practices of the Finns, showed these people had Eastern and not Western affinities. The shaman was only able to perform after working himself up into an hysterical stage, and the office was hereditary in a few families.

Prof. Fleure reviewed the pre-history of Wales, showing the survival of ancient types, and Dr. Wheeler indicated from a study of hill forts how incomplete had been the Romanisation of the Principality.

INDIGENOUS SYSTEMS OF MEDICINE IN INDIA.

REPORT OF THE MADRAS COMMITTEE.

Our Madras correspondent has given the conclusions arrived at by a committee appointed by the Madras Government to consider the recognition of Ayurvedic medicine in the Presidency.[1] The full report, signed by all the members of the committee, is now available; it is moderately brief, but is wholly based on a very cleverly written memorandum on "The Science and the Art of Indian Medicine," prepared by Dr. Srinivasa Murti, the secretary. This memorandum is published along with the main report, and occupies 96 printed foolscap pages, as compared with the 44 pages of the report, and it will not promote the encouragement of the indigenous systems.

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[1] The Lancet, 1923, i., 1231.

Dr. Murti's Conclusions.

Dr. Murti claims to have studied the Indian systems of medicine from the two necessary standpoints, viz.: (1) as a science, and (2) as an art. To begin with his conclusions, they are: (1) The Indian systems are undoubtedly scientific, and their general principles and theories are quite rational and scientific; (2) as an art and as practised at present Indian systems are not self-sufficient, because while they are self-sufficient and efficient in medicine, in surgery they are not.

Six long chapters, some of which contain much irrelevant matter, follow, viz.: (1) Scientific methodology; (2) subjects of preliminary scientific study—the panchabhuta theory; (3) physiology and anatomy—the thri-dhatu theory; (4) ætiology and pathology—the thri-dosha theory; (5) diagnosis and treatment—the rasa-guna-veerya-vipaka-prabhava pharmacology; and (6) Indian systems judged from the standpoint of art.

Science and Mysticism.

It is clear that Dr. Murti depends far too much on the opinions of European "authorities," who would be more correctly called "cranks" in European scientific circles. The line of thought appears in this sentence: "Every system of Hindu thought is at once philosophy, science, and religion, all in one, and one in all." It is always urged against criticism of Ayurvedism that the critic must first learn Sanskrit, then study Ayurveda for several years, and become imbued with the spirit of Hindu philosophy before he can deliver any judgments. If the upholders of Western medicine agreed to this, Ayurvedism would stand practically unassailable. If the professors of Ayurveda intend to incorporate mystic rites with religious ceremonies and Vedic texts, and to maintain that the outcome is a system of medicine, they must remain a cult apart. Dr. Murti's statement that "it is quite as scientific for Ayurvedists to assume the truths of Samkhya and the like as it is for the student of Western medicine to assume the truth of modern physics and chemistry," traverses too much accepted knowledge to make communion possible.

In the chapter on "Preliminary Scientific Study in Ayurveda" an attempt is made to prove that European and Hindu theories of matter are in very close agreement, and that the modern conception of the atom finds its parallel in Hindu scientific thought from the commencement. It is also stated that the original propounders of such theories as that of the evolution of the atoms were persons endowed with immense ranges of vision, because the old Hindu gurus or teachers, "by improving their own internal organs of sense," could extend their range of perception to any desired degree, even to perception of an atom. The microscope and other scientific instruments cannot be thus set aside.

Ayurvedic "Humoral" Theory.

In the chapter on physiology and anatomy further attempts are made to show that modern physiology is gradually coming round to the ancient "humoral" Ayurvedic theory, and that "hormones" and "enzymes" are merely new words for "special chemical complexes," which were thoroughly understood and worked out by the ancient physicians of the indigenous systems. But the mysterious "humours," called Vata, Pittha, and Kapha, must pass through modern physiological laboratories before it can be claimed that these "dhatu-triads" correspond exactly to the catalysts, enzymes, hormones, and other activating agencies of modern Western physiology. Dr. Murti, enthusiastic as he is, seems to hesitate before making the claim, and merely pleads for an understanding study of the ancient Ayurvedic physiology. In anatomy it is admitted the loss has been very heavy, all original works having been lost, and later writers did great harm to Ayurvedic literature by burdening their writings with a "fanciful anatomy" of their own invention.

The chapter on ætiology and pathology is written in the same frame of mind. It is stated that Ayurvedists hold that the only ways in which the body could be invaded are through the mind and senses; hence the subjective Ayurvedic classification of causes of disease is complete and comprehensive, whilst that of modern medicine, which states that invasion of the body is carried out by external agencies of disease, is only objective and therefore imperfect. As regards the bacterial causes of disease, the memorandum goes rampant, quoting, for instance, Sir James Goodhart's Harveian oration for 1912, "even bacteria are probably results and not causes," and pleading that the Ayurvedic thri-dhatu (humoral) theory is what modern research is being driven to recognise, and that there seems to be an essential similarity, if not identity, between the two modes of thought.

Indian Methods of Diagnosis.

Ayurvedic diagnosis of disease is carried out by means of the five senses and by interrogation, whilst examination of pulse and urine have received considerable attention. Some Ayurvedic practitioners even claim that sex, pregnancy, &c., can be diagnosed by examination of the urine, and this claim is supported by the assertion that "if it is possible to diagnose pregnancy by the presence in the blood of an enzyme capable of digesting placental proteins, why should it be impossible to diagnose the same by an examination of the urine?" The method of examination to be adopted is not mentioned, but in any case the above quotation is an illuminating sidelight on the attitude adopted by Dr. Murti, himself trained and qualified in Western medicine.

In the section on treatment it is stated that Western-trained medical men often failed because they did not possess the key to the diagnosis of the *patient*, though they were quite correct in their diagnosis of *disease*. Western medicine apparently has no means of recognising a patient's *prakriti*, or inherited constitution, but acts more or less blindly, and learns from the bitter experience of its patients. Why this prejudiced assertion is made without any proof is not stated, but it again illustrates the writer's mentality. Dr. Murti adds that the category of thadarthakari remedies (a series which produce the same condition as the cause of the disease itself) is wide enough to include all forms of vaccine therapy known to Western medicine. Hence, it is presumed, the promiscuous and dangerous use made in India to-day of all kinds of serums and vaccines! Dr. Murti admits that Ayurvedic diagnostic methods are mostly clinical in contra-distinction to the laboratory methods of Western medicine, but ends by pleading for "a harmonious and judicious combination" of the two. It is impossible to follow him when he maintains that it would be dangerous and even disastrous for a Western medical man to use Ayurvedic remedial measures without an understanding of the principles of Ayurvedic pathology. There can surely be only one scientific system of pathology. Again, the statement is made that "various kinds of vaccines are made from fæces, urine, expectoration, and foul matter from pathological secretions and excretions of various kinds." This statement is used to ridicule the British Pharmacopœia, but Ayurvedists themselves give crushed gall-stones as a medicine and have been known also to prescribe "fresh urea" in the form of cow urine.

Self-sufficiency of Ayurveda.

Finally, under the heading "Is Ayurveda self-sufficient at present?" it is admitted that it is necessary to utilise the services of the Western system in the branches of medicine, surgery, midwifery, ophthalmology, medical jurisprudence, bacteriology, and anatomy; and the stethoscope, the microtome, X rays, polygraphy, the electroradiograph, the cystoscope, &c., are all to be made use of, as is electrical or radium therapy, quinine, emetine, and antimony. "It cannot be that water is H_2O in the west and something else in the east." This fatal admission, made by Dr. Murti, refutes all the laborious arguments he has made, for if water is H_2O in both east and west, can scientific pathology and physio-ogy differ in the two hemispheres ? At present the Ayurvedists admit they have neither teachers nor text-books with which one would expect them to place their system of medicine on a scientific footing. This note cannot be concluded in any better way than by quoting another sentence from the memorandum : "In so far as the one common ideal of all systems of medicine is the preservation of health and the prevention or cure of ill-health, there can really be but one system of medicine" ; but that this is not a widely-accepted opinion among Ayurvedists appears from a recent letter to the press from an Ayurvedic physician, who states that "absolute fusion can never be achieved, for Ayurveda will never consent to lose its characteristic of thinking in terms of its own peculiar religious philosophy of Satwa Rajas and Tamas."

No Hope of Fusion.

There can be no hope of fusion with modern scientific advance so long as this opinion is held. The same writer tries to answer the argument that the Government cannot be asked to place the Ayurvedic systems on a definite footing until they have put themselves in a position which can be recognised as a body and a teaching profession, by pleading that the present obnoxious rite of vaccination could never have survived against the attacks of very able exponents of Western medicine unless it had been bolstered up by Government. This is the level of argument used, and the ignorance displayed, by one of the ablest exponents of the Ayurvedic systems. No Government recognition should be given until the Ayurvedists are prepared to come out into the open, to produce a syllabus for teaching, and to state their methods for the treatment of diseases, so that the scientific world may have some definite proposition to work upon.

INSULIN MEDICATION:

A COMPENDIUM OF EXPERIENCES.

RECENT issues of the *Journal of Metabolic Research* contain numerous papers by different workers in Canada and U.S.A. who have all been working at the treatment of diabetes mellitus with insulin. Vol. II., Nos. 5 and 6, though dated November and December, 1922, contain papers which were received for publication as late as May, 1923 ; this makes for some confusion. All the workers agree as to the great value of insulin, but they differ widely as to the best method of using it. They may be divided into two schools just as the English workers are—those who aim at keeping the blood-sugar normal, and those who pay most attention to the clinical condition and do not mind if the blood-sugar is raised. F. G. Banting, W. R. Campbell and A. A. Fletcher, and F. M. Allen and J. W. Sherrill agree that the fasting value of the blood-sugar should be kept as near normal as possible. E. P. Joslin, R. M. Wilder, J. R. Williams, R. Fitz, H. Geyelin, R. T. Woodyat, and their co-workers all seem to agree that the clinical condition comes first and that the blood-sugar is a secondary matter.

The manner in which the diet has been arranged also differs considerably. Most workers have been using a diet arranged according to Woodyat and Shaffer's principles of the aketogenic ratio and to the basal metabolism. Allen has been using the latest modification of his method which differs considerably from the original method which is still in use in this country. The end-stages of his two plans do not differ very much from each other. The actual amount of carbohydrate which has been given by the different workers has varied, considerably. The dosage likewise has been varied, and it has been necessary in most cases to give two or three doses in the day before the meals at which carbohydrates have been eaten. The following special points demand attention.

Recovery of Tolerance.

Banting, Campbell, and Fletcher point out that recovery of tolerance occurs in some cases, which render the work of estimating how many grammes of carbohydrate are looked after by 1 unit of insulin quite misleading. Especially good results are reported with three children ; in one case the blood-sugar was kept at the normal level, but in the third there was no increase in sugar tolerance, although the child had nearly doubled her weight. They lay stress on the fact that while the diet may be increased to any desired amount provided sufficient insulin is given and the patient kept aglycosuric the proper balance of protein-fat and carbohydrate cannot be neglected ; also, that rest for a weakened organ is a fundamental principle of therapeutics, and that efficient rest may be achieved by the use of insulin and thus give a chance of recovery of sugar tolerance. Patients with septic conditions can take big doses of insulin without showing the signs of hypoglycæmia.

Diabetic Coma.

The treatment of diabetic coma is specially dealt with by Campbell, who comments on the whole question of ketosis. He believes that large quantities of sugar should be given to patients in coma together with large doses of insulin in order to ensure that hypoglycæmia does not occur. The results of such treatment in his hands have been very satisfactory. Fletcher and Campbell have a separate paper on hypoglycæmia and its complications. They found that the level of blood-sugar at which symptoms occurred varied in different persons. Some patients had symptoms when the blood-sugar was only 0·08 per cent., whereas others could tolerate a blood-sugar of 0·06 per cent. without any inconvenience. A good account of the symptoms of hypoglycæmia is given. The first symptom is often nervousness followed by excessive hunger or inertia. This is followed by sweating and pallor, and in children the pulse rate is increased. At a later stage tremor is present and there is a loss of the fine movements of the hands. Aphasia, both motor and sensory, may occur together with great excitement. Syncope may occur and the patients may become unconscious, but no patient has been observed in convulsions. The clinical picture is sufficiently alarming but the symptoms can be relieved very easily. Sugar will at once stop them, but orange-juice and hot tea or coffee will also relieve the subjective symptoms. In emergency a dose of adrenalin, 10 or 15 minims, seems to work instantaneously, but should be followed by a little sugar.

Wise and Foolish Patients.

E. P. Joslin, H. Gray, and H. F. Root report good results with 87 patients, and they emphasise the point that insulin is a remedy for the wise patient and not for the foolish one. The patients usually gained weight under treatment, and they raise the question whether this gain in weight is a sign of any recuperation of the pancreas. The results were equally good whatever the age of the patient. One girl, aged 12, who had only been ill 32 days made a rapid recovery. She had a normal fasting blood-sugar with only 3 units of insulin a day and was able to eat 155 g. carbohydrate. Joslin does not accept the view that the fasting blood-sugar must be brought down to normal at all hazards. He gives an excellent list of rules for patients, and one of the most important is "If your supply of insulin fails reduce your diet by one-third."

The Effects of Dextrose and Lævulose.

R. M. Wilder, W. M. Boothby, C. J. Barborka, H. D. Kitchen, and S. F. Adams report good results with 40 cases treated with insulin. As the insulin in the early stages was irregular in potency a scheme for its standardisation on patients was worked out. They found that if the protein of the diet was increased up to 3 g. per kilo, keeping the caloric and carbohydrate value of the diet constant, the insulin had less effect. Insulin would rapidly cause a patient who was losing nitrogen to gain nitrogen. They do not consider it essential to bring down the blood-sugar to normal.

The basal metabolic rate was unaffected by insulin. Experiments were made with equal amounts of dextrose and lævulose with and without insulin. Lævulose caused a small rise in the respiratory quotient (R.Q.), even when no insulin was given, while after insulin, although both caused an increase, that produced by lævulose was much greater. The specific dynamic action of the two sugars was equal, but the blood-sugar was less raised after lævulose. The authors suggest that the insulin brings the sugar into a reactive form which is more available for oxidation and polymerisation. Further, that it is the position of the C.O. group in lævulose which is responsible for the latter sugar being better used than dextrose. J. R. Williams reports the results of four cases, one of which was very severe. The results were very striking, but there was no sign of any recovery. He advises 2–3 injections a day as being less likely to cause severe reactions. He is doubtful whether the dose of insulin will not have to be increased. He also considers that the blood-sugar should be kept higher than is customary when no insulin is given. R. Fitz, W. P. Murphy, and S. B. Grant report observations on the R.Q. before and after insulin. They found that it rises considerably as the result of the insulin and does not fall again until some days after the insulin has been discontinued. The effect of insulin in bringing the patients into nitrogen equilibrium is very striking. The fasting value of the blood-sugar was above normal in their cases. H. Geyelin, G. Rawle-Harrop, M. F. Murray, and E. Corwin reproduced photographs of three children before and after treatment with insulin.[1] They show the striking improvement which takes place when sufficient food is given. The children all had high blood-sugars and passed sugar before the insulin injections. R. T. Woodyat thinks that it is better to give only one dose in the day. He does not consider that it is essential to aim at bringing the fasting blood-sugar down to normal. One profoundly under-nourished man developed hypoglycæmia after insulin, and although he was given sugar and had hyperglycæmia he did not regain consciousness.

Observations on 161 Patients.

F. M. Allen and J. W. Sherril publish a long account of their work on 161 patients, many of whom had been under observation for a long time. They have been treated on the lines familiar to those who know Allen's work. Certain facts stand out among the mass of detail. Allen believes that the aim of the physician should be so to use the insulin that the fasting blood-sugar should be normal. He gave three instances in which patients were treated on different lines, and shows the dangers of discontinuing the insulin suddenly. The three patients all became ill, but the symptoms of coma were very anomalous and would not have been detected unless the blood had been examined for sugar and acetone bodies. The authors do not think that it is possible in every case to bring the blood-sugar down to normal. Two of their conclusions deserve especial mention. "Insulin has tremendously improved diabetic treatment, but has not simplified it." Again, "Insulin . . . cannot atone for lax or inaccurate dietary methods."

A Defence of the Principle of Undernutrition.

In the first number of vol. iii. of the same journal J. W. Sherril continues the account of the work done in Allen's laboratory with a paper on the influence of carbohydrate and protein on diabetes and the insulin requirement. The diets of the patients were very carefully controlled and were changed in order to bring out special points. He concluded that carbohydrate had a stronger glycosuric effect, and required more insulin than any other kind of food when it was given in equal caloric value. Protein required much less insulin than carbohydrate when it was substituted for carbohydrate either in equal caloric equivalents or in equal carbohydrate content. It was also much less efficacious in the treatment of hypoglycæmia. Some of these results are rather surprising as it had been thought that the specific dynamic action of protein gave it special glycosuric properties. Sherril also concluded that there was no constant relation between insulin dosage and the carbohydrate intake, as it depended very largely on the caloric value of the diet. Allen discusses the influence of fat and total calories on diabetes and the insulin requirement. He opens with a long and able defence of the principle of undernutrition, and attacks the work of his critics, especially Woodyat, Newburgh, and Marsh. Numerous tables are given of diet experiments with insulin. An attempt was made to assess the total insulin requirements of a small girl of 3 years old. This child could only tolerate 100 calories without passing sugar, but with 3 units of insulin 400 calories were tolerated. It is suggested that her initial insulin production was about 1 unit and that she therefore needed 4 units altogether for that amount of food. The evil effects of a great increase in the body-weight due to a great increase in the caloric value are pointed out. In one case the dose of insulin was very large and had to be increased. When the diet was reduced the weight decreased and the dose of insulin could also be diminished. The effect of these facts is that the clinical condition is no longer a guide to the real condition of the patient being treated with insulin. Allen concludes that the principles on which the undernutrition treatment were built have been proved correct by his experiments with insulin. C. H. Best and D. A. Scott had been exploring the possible sources of insulin, and, stimulated in their search by the publication of Winter and Smith's work on the presence of an insulin-like substance in yeast, have been able to demonstrate a substance which lowers the blood-sugar of rabbits in potatoes, rice, wheat, beet-roots, and celery. Working with Banting they have also demonstrated an insulin-like substance in the blood of the ox, dog, rabbit, and man.

Results from Switzerland and Germany.

The *Schweizerische Medizinische Wochenschrift* dated August 30th contains two articles on insulin. Prof. H. Sahli, of Bern, gives a good account of the early work on the search for the internal secretion of the pancreas, paying special attention to that of Zülzer. The latter undoubtedly showed in 1907 that a pancreatic extract had considerable influence on the urine sugar of diabetic animals and patients, but the local symptoms following the injection were so unpleasant that the discovery attracted little attention, and was soon forgotten. Prof. Sahli proceeds to describe the physiological properties of insulin and its effects on patients with diabetes mellitus. He lays especial stress on the importance of combining the use of insulin with the usual dietetic treatment. He gives an account of the method which he has employed for mild and severe cases. If determination of the blood-sugar cannot be made, he thinks it is safer to allow the patient to excrete a little sugar, although he admits that this is not the ideal treatment. He also expresses the opinion that insulin is only a symptomatic treatment, and has no real healing process. But a vicious circle can be broken by its use, and in this sense it has a certain degree of curative value. Dr. M. Guggenheim, of Basel, also gives a good account of the past and present uses in discovering insulin, and of its physiological action and clinical effects. He considers that the amount of food and the dose of insulin should be so chosen that the fasting blood-sugar is within normal limits. A very large number of references is given.

In the *Deutsche Medizinische Wochenschrift*, of August 17th, Prof. W. Ercklentz gives an account of his treatment of six patients with insulin. The clinical results were very good. He also states that if blood-sugar determination cannot be made it is better to allow the patients to pass a little sugar. In the same journal (August 24th) Prof. O. Minkowski, who with von Mering was responsible for the original extirpation experiments on the pancreas, expresses his satisfaction with the properties of insulin. He gives an interesting account of the hindrance to the introduction of insulin into practice in Germany at the present time owing to the difficulties with the exchange and the bad financial conditions.

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[1] See a similar striking case, THE LANCET, 1923, i., 1277.

Standardisation of Insulin.

In "Public Health Reports" (August 3rd) Prof. Carl Voegtlin and Edith R. Dunn describe the difficulties of standardising insulin. They have used albino rats instead of rabbits, as being less expensive. The rats are kept on a constant diet. It was found necessary to keep the temperature of the chamber constant, as the rats were much more easily killed at a temperature of 28° to 30° C. than between 15° and 22° C.

Public Health Services.

REPORTS OF MEDICAL OFFICERS OF HEALTH

THE following table gives some of the principal health statistics of a group of counties for 1922 :—

Name of county.	Estimated population.	Birth-rate.	Death-rates per 1000 of the population.				Death-rates per 1000 births.		
			All causes.	Tuberculosis.	Cancer.	Respiratory with influenza.	Infant mortality		Maternal mort. from childbirth.
							Legit.	Illegit.	
Northamptonshire.. ..	213,340	18·1	11·7	0·9	1·4	1·8	58	77	5·2
Warwickshire..	348,003	21·2	11·0	0·8	1·0	2·2	(60)		5·0
Cambridgeshire	129,591	18·3	12·7	0·9	1·6	—	59	65	3·3
Cumberland ..	218,499	22·3	14·7	0·9	1·3	3·1	99	117	5·1
East Suffolk ..	207,424	19·5	12·6	1·1	—	—	(64)		—
West Suffolk ..	109,406	18·6	13·6	1·0	1·7	2·3	(55)		3·4
Fife	112,384 (extra-burghal)	22·4	12·6	0·8	1·1	2·5	(99)		6·0

The bracketed figures give the total infant mortality. Lines indicate that the information was not given in the report.

Northamptonshire.

Dr. Charles E. Paget reports that a special subcommittee of the county council is considering the coördination of health services but had not finished its deliberations at the end of the year. A move has been made in the direction of having a single small-pox hospital for some of the northern county districts. The Rushden House Sanatorium was opened in the fourth quarter of 1921 for early, middle, and advanced cases of pulmonary tuberculosis. The 50 beds retained for men, women, and children from the county remained full during 1922, but the 18 beds set aside for private patients and other authorities were not so utilised. Two of the latter were used for spinal cases, pending the provision for such cases at the Shropshire Orthopædic Hospital at Oswestry. Some progress has been made in the improvement of water-supplies, but the long delayed scheme for Thrapston is still only under consideration. Housing schemes have provided 530 new houses in 19 out of the 28 districts and private enterprise 90 new houses in 21 districts; but house shortage is acute in the Raunds, Rushden, Desborough, Irthlingborough, and Kettering urban districts and in the borough of Daventry. The veterinary inspection of cattle is proceeding satisfactorily in certain districts, and Dr. Paget hopes it will soon become general in the county. The public analyst reports that 19 of 335 milk samples were below the standard and 8 out of 47 samples of skimmed milk. In one milk 60 per cent. of the fat had been abstracted and in two cases 30 per cent. and 40 per cent. respectively of water had been added.

Dr. Lila S. Greig, in her maternity and child welfare report, shows that 51 per cent. of the births are attended by midwives. She points out the need that the doctor called in to a suspected septic case should give prompt instructions to the midwife. The midwives have been supplied with collosol argentum, but this practice is to be discontinued. It is not thought that the incidence or severity of ophthalmia neonatorum has been diminished by the use of collosol argentum and it has been used by midwives in some cases for treatment, causing a delay in notification. Out of 20 notifications, the sight of the left eye was lost in one case and in another the result is not known, these two cases being in doctors' practices. The other notified cases made a good recovery. Dr. Greig mentions that among the notifications required of the midwives that with regard to artificial feeding is the most neglected. Out of 74 infants reported by the midwives at the end of the year to be artificially fed, only 28 had been notified by them at the proper time. The percentage of breast feeding reached 73·7 per cent. in 1919 but has since declined and was 65·5 per cent. in 1922. Health visiting in the Brackley area is carried out by the Northamptonshire District Nursing Association. Up to September this work was supervised by Dr. Greig, but from that date till the end of the agreement the special subcommittee, mentioned at the outset, has arranged for the work to be supervised by the superintendent of nurses. A report will be furnished to the subcommittee at the end of the period covered by the agreement.

Warwickshire.

Dr. A. Hamilton Wood deals with the pollution of the Rivers Tame, Anker, and Avon. The Tame is already polluted by the Black Country towns before it reaches Warwickshire and steps are being taken to minimise this. Inside the county the Birmingham, Tame, and Rea Drainage Board are carrying out experiments and improvements. As regards the Anker, the Nuneaton Council has converted old contact beds into percolating filters to keep back the excess of suspended matter appearing in their effluent and propose to lay down additional circular filter beds. It is hoped, too, that a satisfactory method has been decided upon for dealing with the long existing nuisance from the trade waste of the Sketchley Dye Works. The Avon is chiefly polluted by Rugby and Coventry. Rugby needs an extension of its filters but their proposed scheme has been restricted by the Ministry. Coventry has been experimenting for two years with bio-aeration (the method worked out at Sheffield), and proposes to apply this method to a daily flow of 3 million gallons at present imperfectly treated by irrigation. The new scheme of the Ministry of Pensions for the vocational training of ex-Service men suffering from tuberculosis is mentioned and it is pointed out that there is apparently insufficient accommodation at the training centres. In Warwickshire 17 men were examined in the summer of 1922, and six were passed as clinically suitable. Of these six, four were still waiting for vacancies in January, 1923.

Dr. Wood complains of the incomplete notification of births and suggests that it may be partly due to deliveries being conducted by handywomen who are afraid to notify. Of 7373 births, 505 were not notified. The mortality from puerperal fever was the highest ever recorded in the county. Dr. Wood also refers to the large number of still-births and does not see much likelihood of improvement till the practice of midwifery is given a higher place. In view of the many problems worthy of careful study which confront the accoucheur and the fact that midwifery deals with the ante-natal, natal, and post-natal states, he thinks that midwifery should rank in importance with other specialised branches of medicine "and not be left in the haphazard hands of the rank and file of the profession." The excellent system of voluntary infant welfare centres run in coöperation with the county council's scheme continues to develop. There are now 29 centres throughout the county. Three new centres were organised during the year, in spite of the fact that no grant from the Ministry is available for this extension; they are financed entirely by voluntary funds. The amount available for free milk has been made to go further by limiting the amount granted to each household (except in the case of bottle-fed twins) to one pint of fresh milk daily or three packets of dried milk fortnightly. Dr. Wood thinks notification of ophthalmia neonatorum should be made direct to the county medical officer of health, but he is in the happy position of recording that of 59 notified cases of this disease, all recovered with vision unimpaired.

Cambridgeshire.

Dr. Frank Robinson's report shows that much attention is given to the question of the midwifery and nursing service both in the county and borough of Cambridge. Through the agency of the County Nursing Association the number of trained midwives has increased since 1916 from 24 to 50. There are now only four untrained midwives. All the trained midwives practising in rural areas are also district nurses. During 1922 three grants were made to the County Nursing Association for the training of nurse-midwives who have to undertake to practice for three years in the county after becoming qualified. Through the County Association three new district nursing associations covering ten parishes were started during the year. Grants are also made by the county council towards the expenses of some of these district associations in employing nurse-midwives. Since the passing of the Midwives Act, 1918, the proportion of cases in which the midwives summon medical aid has gone up from 5·2 per cent. in 1919 to 7·2 and 7·1 per cent. respectively in 1921 and 1922. Of the 152 cases in which a doctor was called in during 1922, the county council paid the fee in 102 cases but, wherever possible, the fee is recovered from the patient in whole or in part. The borough has its own maternity and child welfare scheme, and under this scheme 139 expectant or nursing mothers received dental treatment, of whom 58 were provided with artificial dentures, one condition being that they agree to their children receiving dental treatment both up to 5 years of age and during the whole of their school life. Some progress has been made in housing matters, but Dr. Robinson estimates that some 600 or 700 new houses are still required in the county, apart from new houses needed to replace worn-out property. The severe drought of 1921 stimulated the provision of schemes of water-supply, and progress in this direction is reported.

Cumberland.

Dr. F. H. Morison is inclined to attribute the great increase in infant mortality to unemployment and the resulting inadequacy, especially as regards vitamins, of the diet of a large section of the community. The districts which showed the highest rates were those where there was most distress—viz., Cleaton Moor, 166; Whitehaven, 160; Workington, 127; and Egremont, 121. Dr. Morison returns to the food question in speaking of the prevention of tuberculosis, and expresses his belief that education of the community in food values would constitute one of the most valuable public health campaigns. He thinks we should do as is done in the case of quack medicines and proprietary articles—i.e., we should repeat our teaching until everyone is convinced that what is repeated so often must be true. He thinks the two most hopeful methods of dealing with tuberculosis are segregation of advanced cases and raising the resistance of those who are most susceptible, such as contacts, debilitated, and so-called pre-tuberculous children. He suggests that the Industrial School at Cockermouth, at present disused, might be used with the latter object as a preventorium for debilitated children. Returning to the subject of the high infant mortality rate, Dr. Morison points out that "at the present time there are no maternity and child welfare centres in the county with the exception of the one at Wigton, which is worked by the Wigton District Nursing Association."

The medical superintendent of the Englethwaite Industrial Colony for Consumptives, Dr. Mark S. Fraser, reports that of 79 men who received treatment and training and left during the last three years 23 are earning their living. Of the 23, 16 are in receipt of a modified pension and it is impossible to say if they would be able to maintain their families without this subsidy. Eleven of the 23 are working at trades learned at the colony. Dr. Fraser has seen most of them and finds that their health and working capacity are not nearly so good as those of the seven ex-colonists who are employed at Englethwaite. In consequence letters have been addressed to the sanitary authorities concerned asking them to establish after-care committees to befriend ex-colonists belonging to their own areas.

East Suffolk.

Dr. G. I. T. Stewart points out that for railway and other reasons the problem of locomotion is a difficult one in East Suffolk, and that the formation of combined districts with whole-time medical officers is not easy. Hospital accommodation is "lamentably deficient," and for this coöperation is the remedy. Dr. Stewart suggests a scheme for four areas based on an adequate motor ambulance service: (1) southern area—hospital at Ipswich and Felixstowe; (2) north-western area—hospital at Stowmarket (West Suffolk to be asked to join); (3) north-eastern area—hospital at Lowestoft; (4) central area—to be provided for by a county hospital at Saxmundham. The V.D. work is done at Ipswich and Norwich, but a clinic is needed at Lowestoft. The inspection of midwives is carried out by the superintendent of the Suffolk County Nursing Association. Lowestoft has its own child welfare scheme. Otherwise there is little to record in the way of "centre" work. There are three one-day-per-week centres at Aldeburgh, Beccles, and Stowmarket with average attendance of 6, 15, and 17 respectively, and centres started at Felixstowe, Leiston, and Wickham Market have closed down owing to lack of interest.

West Suffolk.

Dr. A. H. Bygott reports that the proposal to form the sanitary areas of the county into two combined districts, each with its whole-time medical officer of health, has been rejected by a meeting of representatives. An alternative was the adoption of the Essex system, but only four of the district medical officers of health hold the diploma of public health. The Bury St. Edmunds administrative bodies have expressed dissatisfaction that more is not done for advanced cases of tuberculosis. Dr. Bygott points out that one cannot establish "homes for the dying," that the county sanatorium has raised its beds to the maximum, and that the fever hospitals in the county are not suitable for the purpose. The county council were prepared to take over the infirmary of the Bury St. Edmunds guardians. The Ministry of Health suggested the Mildenhall Workhouse, but its inaccessibility and the cost of adaptation and administration ruled it out. A more effectual remedy, says Dr. Bygott, is for the county and county borough councils to take over the treatment of the sick from the boards of guardians.

Fife.

Dr. G. Pratt Yule says measles, whooping-cough, and respiratory disease have played their part in the increased infantile mortality of 1922, and refers to overcrowding as the determining factor in the fatality of these diseases. In some areas housing schemes, aided by emigrations to the Colonies and U.S.A., have relieved the situation, but among the more busy mining communities there is much subletting which is tantamount to overcrowding. A large shelter has been fitted up with 16 cots for the treatment of surgical tuberculosis in children at the Glenlomond Sanatorium. Cases of pulmonary tuberculosis are being reported earlier, and male cases are accepting institutional treatment at an earlier and more hopeful stage.

Dr. Yule refers to the "handywoman" difficulty. Not infrequently, he says, unqualified women appear to be the sole attendants at confinements, but when investigation takes place there emerges "the shadowy supervision of a medical practitioner." Dr. Yule has written to the C.M.B. for Scotland for guidance as to what constitutes "direction" on the part of a medical practitioner, but so far no light has been forthcoming. He mentions that the Royal Sanitary Institute and the County Councils' Association have approached the C.M.B. for England on the same point, and that the English Board are of opinion that "under the direction of" means "in the presence and under the direction of" and further, that they (the English Board) intend to take the earliest opportunity of pressing for an amendment of the subsection of the Act dealing with the matter which will remove the words "habitually and for gain"—words which render the subsection futile at present.

Correspondence.

"Audi alteram partem."

CANCER AND DIET.

To the Editor of THE LANCET.

SIR,—Your leading article under the above title in THE LANCET for last week obviously necessitates a reply from me.

Needless to say, no one can regret more than I myself the "flamboyant" and unwarranted statements that appeared in a certain section of the public press in reference to my paper in the Physiological Section at the recent meeting of the British Association. And I specially regret that your criticism of my communication should have been based on unsatisfactory reports. Rationing in this country during the last year of the war was fairly stringent, in the large towns at any rate, this stringency having been specially marked as regards those foodstuffs which, as you state, provide the main part of the fat-soluble vitamin A in a normal dietary. And yet, except as regards tuberculosis, there is, so far as I am aware, little evidence that the public health was adversely affected; while, as indicated by the Registrar-General's statistics, the cancer mortality for both sexes, especially in London, was slightly though definitely diminished. In the case of the Central European States to which you allude additional factors came into operation.

My own investigation as to the results of a dietary deficient in the fat-soluble A factor but sufficient (and this is the important point) in every other respect, while at the same time varied and appetising in character, has now extended over a considerable period,[1] and has included an experience of it in my own person lasting for nearly a couple of years. During this time I was necessarily engaged in a certain amount of physical as well as mental work. Yet it was not until the end of that period that I experienced any noticeable ill-effect as the result of the experiment—a skin affection of the palms of both hands which readily cleared up on the addition to my dietary of uncooked vegetable food in the form of salads. And Dr. Wyard,[2] reporting on our investigation at the Cancer Hospital, which you quote, stated in reference to patients on this dietary that "In no case was any unfavourable change in the general condition of the patient attributable to the diet, and in many improvement was definite, at least at first." The medical superintendents of several infirmaries in which patients have also been under treatment have reported to the like effect. The suggestion that I have overlooked the literature of the subject, and, more particularly, the work of Prof. J. C. Drummond, is hardly borne out by the fact that in my paper I specifically referred to his investigations and, as regards the growth of tumours, stated that I was in general agreement with his views.

The second paragraph of the article would seem to be superfluous in view of the fact that in my paper I stated that the use of the dietary had not been found to exert any specific differential effect on the growth of the tumour, as had originally been hoped might prove to be the case; and that consequently the cure of cancer was not in question, the methods being at most palliative only. As regards this latter point, it may be noted that Dr. Wyard in the report you quote makes the statement that "general improvement, though slight, was in some instances definite." It may be mentioned that estimates as to probable prolongation of life in any instance have necessarily been based on the opinion of those in medical charge of the patients as the outcome of their general experience of cases in similar condition.

As regards the final paragraph, I may perhaps be permitted to state that a few months ago I submitted to a meeting held in the laboratories of the Imperial Cancer Research Fund, under the chairmanship of Dr. Murray the Director, a communication practically identical in terms with my Liverpool address. This meeting, at which Dr. Wyard was also present, afforded opportunity for helpful criticism. The dietary in question has been gradually evolved as the outcome of consultations with Prof. Gowland Hopkins and other bio-chemists; of experiments on myself, and, with their consent, on other private individuals, and of patients in various public institutions; as also of a comparative study (not yet completed) of the dietaries and vital statistics of certain "enclosed" and "unenclosed" religious communities in this country and abroad.

It is, I think, unnecessary to comment on the assumption with which the article concludes.

I am, Sir, yours faithfully,

Sept. 24th, 1923. S. MONCKTON COPEMAN.

PROBABILITY AND EXTRASENSORIAL CHANNELS OF KNOWLEDGE.

To the Editor of THE LANCET.

SIR,—In his address on Extrasensorial Channels of Knowledge (THE LANCET, Sept. 8th), Prof. Charles Richet brings forward evidence which, in his opinion, establishes the truth of "knowledge of reality obtained by other means than by the ordinary channels of the senses." Some of this evidence is of the following character. A dreams that B, of whose movements he can have no direct means of information, has died, and, in fact, B *has* died. To the retort of the man in the street that this is a mere coincidence, Prof. Richet replies: "Chance is, indeed, a very convenient god, to which we can always appeal. But why should we introduce these extremely small probabilities into our calculations? Practically we never come across a probability of 1 to a 100 million, and yet this is the figure at which one must assess the probability of Wingfield having once in the course of his life a single hallucination, and that just the hallucination of his brother being killed at the same moment. Chance will evidently not explain these occurrences." I do not know how it is possible to assess the arithmetical value of the probability in Wingfield's case, since I have no knowledge of the frequency or contents of this gentleman's dreams, save in one instance, but the man in the street would surely rejoin that, far from never coming across probabilities of 1 in 100 millions, he meets them almost every evening. The probability that the dealer at bridge will distribute the 52 cards in any assigned order is measured by a fraction which has more than 60 zeros after the decimal point before we reach a significant figure, it is the reciprocal of the continued product of 52 × 51 × 50, &c. Events, the probability of which is so immensely less than Prof. Richet's 1 in 100 millions, happen regularly wherever four bridge players are gathered together. Evidently there is something wrong. The philosophy of the calculus of probabilities has engaged the attention of many eminent men and they have made such sad mistakes, according to Mr. J. M. Keynes, that it is dangerous for a mere statistician to suggest an explanation; but, as the use of probabilities is very common in medical inquiries and so distinguished a physiologist as Prof. Richet has employed that calculus, it may be of interest to play the devil's advocate and to argue that Prof. Richet's treatment of his problem is wholly fallacious.

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[1] Copeman, S. M.: Brit. Med. Jour., 1920, ii., 159, Discussion on the Present Position of Vitamines in Clinical Medicine.

[2] Wyard, Stanley: THE LANCET, 1922, i., 840.

The point I submit is, that in any rational application of the calculus of probabilities there is always expressed or implied an alternative. Thus suppose four persons sit down to play bridge and the dealer receives the whole of a particular suit. The chance that this will happen is much less than one in a billion, a good deal smaller than one in 100 millions. Suppose the four players are intimate friends, they may be surprised, they may even write to the *Field*, but they will not suspect the dealer of cheating. But suppose that the four players are total strangers come together in the smoking room of a transatlantic liner, the opponents of the dealer who has dealt himself or partner 13 of a suit might do more than write to the *Field*. The point is that the alternatives in the two cases are not deemed to be equally probable. The probability that an intimate friend has cheated at cards is deemed to be very much less than 1 in a billion, but the probability that a total stranger has cheated is thought greater than that a particular event of this order of frequency *and favourable to him* has happened.

Consider the method of application of the calculus of probabilities to medical problems, usually regarded as legitimate. A persons have been attacked by a disease and treated with a particular remedy and a have recovered, B persons similarly attacked have not been treated and b have recovered. The fraction a/A is greater than the fraction b/B; is the difference significant? Let us suppose, which is *not* always true, that A and B are, apart from the giving or withholding the remedy, absolutely *in pari materia*, and that the probability that such a difference as $a/A - b/B$ might arise "by chance" can be arithmetically computed—which again is not always true—and that we find this chance to be 1 in a billion, what is the inference? The inference depends upon the nature of the alternative. If the remedy is such that its *possible* activity is not incongruent with the whole of our knowledge, we shall infer that it is more likely that the remedy had an effect than that an event which on the average happens once in a billion trials has happened this time. Suppose the disease were acute intestinal obstruction and the remedy painting the left wrist with iodine; we should refuse to believe that the cases were *in pari materia* or we should adopt the attitude of the friendly bridge players. Suppose the disease were diphtheria and the remedy antitoxin, we should unhestiatingly accept the alternative. Between those extreme terms lies a continuous series of instances; the mere statement of a probability is not and never can be sufficient of itself, it is only great or small in relation to something else. That is, of course, the argument of Hume—stated before his time by Locke, who said, "It is harder to believe that God should alter or put out of its ordinary course some phenomenon of the great world for once, and make things act contrary to their ordinary rule purposely, that the mind of man might do so always after, than that this is some fallacy or natural effect of which he knows not the cause, let it look ever so strange."

I need not use space to point out the application of these considerations to Prof. Richet's thesis, but those who are interested in the particular class of investigations to which he refers will find a very instructive discussion of the application to them of the calculus of probability in Prof. Edgeworth's notice [1] of Prof. John Coover's investigations.

I am, Sir, yours faithfully,
MAJOR GREENWOOD.

National Institute for Medical Research,
Hampstead, N.W. 3, Sept. 21st, 1923.

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[1] Jour. Roy. Stat. Soc., lxxxii., 1919, 222.

A PLEA FOR THE NATIONALISATION OF OUR MENTAL HOSPITALS.

To the Editor of THE LANCET.

SIR,—It is not until quite recently that the attention of the medical profession, and to a certain extent of the general public, has been at all directed to the position of the treatment of disorders of the mind. Probably owing to their extreme complexity it has remained more or less in the background. No attempt has been made on anything but the smallest scale to apply the same methods of investigation and treatment which mark other branches of medical science. As a result the insane have been merely herded together in public institutions really more concerned with the safeguarding of the public than with alleviating the sufferer. Reform on these lines has merely meant a more humane segregation, with the result that scattered all over the country we find these large buildings, for the most part admirably and economically administered, where the insane are housed and fed while they may or may not recover. What position these institutions hold in the opinion of the outside public is clearly shown by the fact that practically all admissions to them are involuntary. Nowhere is there yet set up a system where the early sufferer will come for advice and treatment in the same way that he will flock to the ordinary out-patient department of any of our large hospitals.

But at last the mystery attached to the label "mental" is gradually being solved and removed. It is recognised that for the best results cases must be seen in their incidence. Also that disorder of the mind requires not only the specialist trained in psychological methods, but the help of the pathologist and the physician, in fact of every branch of the profession. And not only this, but equally important is skilled nursing of the very highest order. With what result? That the treatment and study of mental diseases is passing to the place where only these advantages can be reaped—into relation with our general hospitals and teaching centres. For if, say, a case of cardiac disorder or a fracture turns out badly, the patient can still carry on under a partial disablement; but let a disorder of the mind become chronic and it results in a complete failure and a permanent loss to the State. It is quite impossible and also unnecessary to alter our present asylums and make them into hospitals suitable for the reception and treatment of acute mental disorders; and equally impossible for the large bulk of their present medical staffs to keep themselves abreast of modern methods. And neither is this the most economical method. It is waste of time, money, and personnel to employ a highly trained staff on the nursing of idiots, dements, and the hopelessly insane. Having regard for the treatment they require, we can divide our patients roughly into two classes: in the early stages, when everything that our science can possibly do for our patient must be tried; if this fails in its end and no recovery takes place, we pass to the second, the chronic or hopelessly insane, requiring merely some institution where they can be looked after as economically as possible with due regard to their happiness, comfort, and welfare, and where they can be employed to the best advantage with regard to their cost of maintenance and by this means made the least possible burden to the State.

Now arises the problem, how can early mental disease be brought into contact with the conditions it requires for its treatment? It is impossible to think that under present conditions this will ever maintain in the majority of our county or borough asylums. Their isolated position alone is almost a bar to most of them. Neither ought the matter to remain in statu quo until the country can stand the enormous expense of building and equipping new and modern mental wards. In the meantime there is one obvious way in which the best can be done for the sufferer. It is out of the question that every case of mental disorder can be sent for treatment to one or other of our great teaching centres. But why not bring a recent product of this centre to him? A constant supply of skilled physicians, au fait with every advance in the diagnosis and treatment of mental diseases, must be supplied to all our county and borough asylums. Not to one or two of them, but to every one in which early acute cases are admitted. Present buildings cannot be altered, neither can their inaccessibility; but at least they can be supplied with a staff of the highest efficiency, who will do their best in the conditions under which they have to work to apply for the benefit of those under their care the methods of investigation and treatment emanating from our hospitals and universities. And this can only be brought about by nationalising the whole asylum service and bringing it under one central control.

Let us consider such a service a little in detail. It should most certainly come under the Ministry of Health, and the nucleus of its special control, or "G.H.Q. asylums," already exists in the present members of the Board of Control. At present this Board has no control, or practically none, except perhaps from a legal point of view. But under a national scheme it would own completely all asylums at present designated "pauper." It could introduce what reforms it wished, appoint the various resident staffs, and its visiting consultants could take with them into town and country a knowledge of the most recent methods of investigation and treatment, to place at the disposal of the resident staffs. For who has not served as house surgeon or later as divisional officer and does not appreciate how such visits keep a man up to the scratch? And how much better employed would skilled physicians be going over our recent admissions with us, teaching us and advising our actual treatment, than writing reports recommending a more general use of toothbrushes in such and such institution, or saying how nice the patients' dresses looked. In the same way there would exist at the Board of Control a department corresponding to that of the Quartermaster-General. These gentlemen would standardise everything in use, from dress material to medical stores, and would distribute them as in the army from a central depot or depots. Some commodities it would conceivably be cheaper to purchase locally. They would appoint the officers, and visit, inspect, and control the departments at present known as "stores," "farm," "clerk of works," "accounts," and even the padre. Corresponding members of asylum staffs would constitute a "service" just as would the medical side, and would reap the same benefits.

There would be an entrance examination, standardised pay, promotion, and pension. Examinations qualifying for promotion to a higher grade in the service would have to be passed before any step upwards, and most important, "movement orders" would be issued by the Board of Control. In this way all medical officers would periodically and regularly pass through one or other of our teaching centres as a part of their duty; there would be none of the present farcical method of appointment, and no one would be left out in the cold to rusticate and become a typical "chronic" to his own detriment and that of the patients under his care. Anyone failing to qualify for promotion would not be kept in the service but the right men would get to the top. It is the staffing of hospitals where actual treatment of recent cases is being undertaken which calls for the highest efficiency. To these would be supplied the young, active, progressive, and best qualified members of the service. Senior members would eventually be automatically moved either to fill purely administrative posts, or to the essentially chronic buildings where wise and economic administration is the main asset; and where their experience and foresight can be used to the best advantage of the service as a whole. The nursing service would be similarly constituted. Each institution would have a definite establishment, promotion to positions corresponding to N.C.O.'s would all have to go through G.H.Q. before being confirmed, recruiting locally for the junior posts, or "privates" if necessary.

The entire cost would be taken off the shoulders of local authorities and would become a common universal Government tax. The total expenditure of all our county and borough asylums for the year 1921 was under 8 million pounds, about the cost of one modern battleship, very little to pay when the importance of the question is realised. For the Government to take over its mental hospitals means no new expense, but merely a transference from a local rate to a national tax. A single control is absolutely necessary to prevent overlapping and to ensure economy and efficiency. Present institutions can then at once be used to the best advantage of the service, and not as at present, merely for local requirements. Some would be used solely for the chronically insane, on whom it is a waste of money and personnel to employ a highly skilled staff. Empty beds in these institutions can always be filled by segregating patients with no friends. Others could be specialised into convalescing hospitals, where patients on the way to recovery can be sent to reap the benefit of outdoor occupation; this in turn easing the demand for accommodation in the acute blocks. Of two more or less adjacent buildings, the one more easily adaptable and more accessible for a visiting staff could be used as the acute building for the reception of new cases, the other becoming essentially chronic in character and therefore needing no modernising and no highly skilled staff. It would seem that by wise administration the general lunacy tax should be appreciably less than the present average county or borough maintenance rate.

The patient, and a medical staff with the necessary training and skill, are brought into contact near to the former's home and friends. Beds for the early treatment of cases can be subsidised by the Government in some of our large general hospitals, out-patient departments set up and the best advice brought within the reach of all. Not only the patients' treatment, but their food, clothing, occupations, and amusements would be uniform and the best available. The present farcical investment of a lay committee with practically the sole right of discharge would depart into the waste paper basket. This power would be invested in the medical superintendent, at whose disposal in difficult cases would be the advice of the whole of the consulting staff of the service. A patient could receive his discharge as soon as fit and not have to wait for monthly meetings. And so it comes about that the very best of advice and treatment is placed at the disposal of the poorest; a state of affairs which maintains also in every other branch of our profession.

It would be up to each private mental hospital for the reception and treatment of acute mental disorders to put its house in order; the entire cost of which, of course, they themselves would have to shoulder. There could exist no possible bar to the present practice persisting of private patients being received into Government institutions. Provided, of course, that such buildings were deemed by the Board of Control as suitable for the class of case received, and that the charges, depending on the advantages and conditions offered, were privately borne. This paper is written in no attitude of criticism, nor does it pretend to have solved more than a very few of the difficulties, but rather in a spirit of hope that this important matter may soon be taken up. There is no money available in the country for expensive new buildings. Meanwhile, the problem is to make the best out of what we have actually got. How to tackle the task, so that as speedily as possible, an efficient service can be brought about with as little waste and as little disturbance as is absolutely necessary. At present, for obvious reasons, Smith who goes insane in "Blanktown" may receive every advantage and chance of recovery for 20*s.* a week; whereas Brown, because he happens to be domiciled in "Muddleshire," starts with a 30 per cent. disadvantage at perhaps half a crown a week cheaper. The brains of a country are its most important asset and should be the first charge on its estate. The present standard of the treatment of the insane as a whole is many years out of date. To bring that standard on to a level with that reached in any other of the ills that flesh is heir to, is a national affair, a matter of vital importance to future generations and to the race as a whole. It is surely up to the nation to take the matter in hand and to shoulder its responsibility, for private enterprise must inevitably fail. There must be some central controlling and guiding authority. Run something on these lines it would make a most attractive service. Not only will it attract good men into its own special branch, but it can utilise and bring the best brains in all branches of the profession as a whole, to bear on to the most difficult and abstruse of all medical problems. Difficulties there will be, but they can all be got over, and fortunate will be those privileged to assist in working out the scheme and to see it actually working. For come it will.

I am, Sir, yours faithfully,
A. T. W. FORRESTER, M.D. Lond.

Leicestershire and Rutland Mental Hospital,
Narborough, Sept. 18th, 1923.

INJURY AND DISEASES OF THE ARTICULATIONS.

To the Editor of THE LANCET.

SIR,—Mr. Timbrell Fisher is greatly to be congratulated on his research work in that very difficult field of physiology, the articulations, of which he gave a brief résumé in your issue of Sept. 15th. In discussing treatment, Mr. Fisher suggests that in many sufferers from arthritic disease of non-tubercular origin the infection has come to an end and that the whole of the symptoms are caused by the deformity, and he further implies that in this stage of the disease manipulative and presumably operative methods can be undertaken with a certain degree of safety, provided that too much force is not used in manipulating the affected joints. Mr. Fisher goes on to say that forcible manipulation is not advisable in the more acute forms, as it may give rise to a reaction after which the joint stiffens once more.

I would like to make it axiomatic in dealing with these conditions that until the disease is extinct—that is to say, until the infection is eradicated and there is no longer any risk of auto-inoculation—nothing forcible of any kind whatever must be done. I would add that manipulation may do a great deal of harm, because it may result in the spread of the disease into other parts of the body hitherto unaffected. The converse of this axiom is also true: once the infection is eradicated, any measures, manipulative or operative, can be undertaken with perfect safety. I base these conclusions on some 15 or 16 occasions when operative or manipulative measures were undertaken. Of these all have been successful except four. One of the four was a patient who, unfortunately, died from alcoholic delirium a few days after the operation. I have no reason to suppose that it would not have been successful. In the case of the other three, the operations were undertaken before the disease was eradicated, and the result was that some extension of the disease took place, and there was a long period of convalescence before anything further of this nature could be done. In one case three years, in another case six months, and in the third case not at all.

But it may be asked by what signs we may know that the infection is eradicated. This is a question of the greatest importance on which one would like to hear Mr. Fisher's views. All the patients in my care have undergone a course of vaccine treatment, and the antigens in every case have been streptococci, either stock or autogenous or both, and in the majority of cases *M. deformans*. My experience shows that as long as the patient is sensitive to small doses of these vaccines, it is neither safe to manipulate nor operate. But as soon as the patient can take large doses without any reaction, both are absolutely safe. Thus the three cases above-mentioned in which manipulation or operation failed were still sensitive to quite small doses—e.g., half to one million—whereas the whole of the successful cases took large doses, more than 20 million without reaction.

The criterion I would suggest then is the absence of response to a large dose of an appropriate vaccine. When, however, we consider the question of what that dose should be, some difficulty arises. It appears that vaccines prepared in different laboratories differ materially. I am quite ready to make a definite statement in regard to the correct "safety" dose of the vaccines I use, made in my own laboratory, and would put it at 20 million combined stock streptococci and *M. deformans*. But then my initial dose is one-tenth of a million, either of streptococci or *M. deformans*, and even this frequently cannot be tolerated previous to a course of desensitising peptone; whereas doses of streptococcal vaccine recommended by clinical laboratories and given by other men are usually far larger. Compare this initial dose with that of five million advocated by Dr. W. H. Wynne, for example, in your issue of Sept. 22nd. The reason of the discrepancy I do not know, unless it lies in the fact that 45 perfectly different varieties of streptococci comprise this stock vaccine and all were freshly isolated.

I am, Sir, yours faithfully,
Harrogate, Sept. 22nd, 1923. H. WARREN CROWE.

THE CAUSATION AND TREATMENT OF PRURITUS ANI.

To the Editor of THE LANCET.

SIR,—Pruritus ani is very common, and its causation appears to be wrapped in obscurity; its treatment, therefore, is naturally unsatisfactory. As Dr. E. F. Hoyt of New York has said, "the meagre literature upon this subject hobbles upon the crutches of hypothetical inferences which suggest a panoramic array of medical agencies, all unsatisfactory, and thereby confessing to a sad condition of helpless empiricism." Having been a sufferer from this complaint off and on for 34 years, it has occurred to me that my personal experience with regard to its treatment may be of value to those who have cases of this sort. I found that relief could always be obtained by getting out of bed as soon as one was roused by the itching, and after evacuation of the irritating mucus by straining, by free washing of the everted mucous membrane with cold water. This usually produced a quiet condition for the rest of the night. Then I found a collapsible tube of carbolic vaseline about ♏ ix. to 1 oz. of use; a little applied to the anus and into the bowel immediately before going to bed enabled me to get to sleep without the onset of the itching which otherwise seemed invariably to occur as soon as I tried to compose myself to sleep. For years I slept with a tube of this vaseline by my bed, and if I woke in the night I always applied a little of the ointment and so repressed the inclination to scratch.

About 24 years ago I consulted Sir Charles (then Mr.) Gordon-Watson. He held the view that the cause of this trouble lies in the papillæ of Morgagni, which, situated at the anorectal junction, are absent in the majority, yet present in a considerable proportion of individuals. They are normally small white glistening papillæ, pyramidal or triangular, with the apices directed upwards and inwards towards the lumen of the gut. They vary from one to six, and when hypertrophied resemble in size and shape the writing end of an ordinary lead pencil; when much hypertrophied they may be felt as small shotty nodules. In some cases one finds small fibrous branched papillæ as well; and I think it is advisable to destroy these also as they may possibly be an additional source of irritation. Dr. Campbell Margarey wrote a paper on this subject several years ago in the *British Medical Journal*, from which I quote freely. He examined 50 out-patients with the speculum and as far as possible in consecutive order. In this series papillæ were present in 19 cases, or 38 per cent. The average age was 39 and of those in which papillæ were found was 38 years. The number of papillæ varied from one to six, with an average of two. In a series of patients suffering from pruritus ani attending the out-patient department from June to November, 1910, hypertrophied papillæ were present in 13, or 25 per cent. The papillæ were cauterised more or less thoroughly in all these cases, and in only one was there a lack of improvement. The majority made two subsequent attendances, reporting great relief, and then ceased to attend. This would serve to show that the cure of this exasperating complaint had been effected. In my own case Sir Charles Gordon-Watson destroyed these hypertrophied papillæ with the electric cautery. This was done without even a local analgesic and was not very painful. The itching, which had become unbearable, disappeared at once like magic, and I remained absolutely free for about five years. There was then a slight return occasionally, but carbolic vaseline kept it in check. About a year ago, as the pruritus had again become rather troublesome, I was examined by a surgeon, having first told him what he would probably find. He destroyed five or six papillæ with instantaneous results, and has since treated four similar cases with equally good effects. The reappearance of a papilla is in my case always attended by a return of the pruritus and discharge of irritating mucus which rapidly causes the skin to inflame.

It is possible for the patient accurately to locate by his own sensations the position of the papilla—e.g., at 6–9–10 o'clock—and in this way he can guide the operator as to where to look for it. If the skin be excessively sensitive and the sphincters very irritable, a little ½ per cent. novocain solution may be injected into the sphincters so as to cause their paralysis and allow of free exposure of the affected area. In one of our cases spinal analgesia was resorted to on account of the extreme excoriation and sensibility of the parts. The patient should be warned that the papillæ are likely to recur, and advised to return for their destruction immediately any fresh itching is felt.

I am, Sir, yours faithfully,

F. J. W. PORTER,
Bombay. Major, R.A.M.C. (retd.)

THE MILNE TREATMENT OF SCARLET FEVER.

To the Editor of THE LANCET.

SIR,—The article by Dr. G. Gushue-Taylor in your issue of Sept. 8th on the Treatment of Scarlet Fever by Eucalyptus Oil and Carbolic Oil versus Isolation is a convincing demonstration of the futility of the treatment which has become associated with the name of its originator. What can be said of a method which, in the hands of the late Dr. Milne himself, produced a "return" case-rate of 46 per cent.? What would be said of any isolation hospital which produced any such a percentage of "return" cases of scarlet fever? The figures show that in 1904–5 cases treated by Dr. Milne by isolation gave a return case-rate of 1·2 per cent.

In 1918 cases treated by Dr. Milne by the Milne method—return case-rate 46 per cent.

In 1921 cases treated by Dr. Gushue-Taylor by the Milne method—return case-rate 28·2 per cent.

In 1922 cases treated by Dr. Gushue-Taylor by isolation—return case-rate 3·7 per cent.

There are two criticisms of the so-called Milne treatment. 1. It is prima facie unscientific. One could not expect any satisfactory sterilisation of the pharynx to be effected by the methods proposed. Further, scarlet fever is not spread by the skin, therefore the treatment with eucalyptus oil is a redundancy. 2. It has now been proved by an investigation lasting over 18 years that in practice it does not work. It is desirable to call attention to the article as some medical officers in search of a cheaper and more satisfactory method of dealing with scarlet fever than hospital isolation have sought to find it in the Milne method. Many cases of scarlet fever can be nursed at home, but the Milne treatment is of no assistance in preventing the dissemination of the disease or in lessening its complications.

I am, Sir, yours faithfully,

A. H. G. BURTON,
Sept. 18th, 1923. Medical Officer of Health, Ilford.

Obituary.

MARGARET BOILEAU, M.B., B.S. LOND.

THE death of Dr. Margaret Boileau on Sept. 17th at Norwich removes an interesting personality from the ranks of medical women. Born in 1867, Dr. Boileau qualified M.B., B.S. Lond. in 1906 from the London (R.F.H.) School of Medicine for Women, having taken up the study of medicine preparatory to devoting herself to social and religious work. After working as clinical assistant to out-patients at the Elizabeth Garrett Anderson Hospital she started a general practice in Hammersmith, but for family reasons she was obliged to give up her medical work and return to her home at Ketteringham, in Norfolk. Here she engaged in social and medical activities, giving lectures on physiology to missions, lectures on venereal diseases, first-aid and Red Cross lectures, and assisting at an infant welfare clinic at Norwich. During the war Dr. Boileau became commandant of the Swainsthorpe Auxiliary to the Norfolk and Norwich Hospital and her work was specially commended. She was also Commissioner of Girl Guides for South Norfolk, and was elected as lay representative on the House of Laity, being one of the first women to hold this position.

Dr. Boileau will be much missed in Norfolk. Having an unusual faculty for explaining scientific truths in a clear and simple manner, her talks on hygiene and kindred subjects were much appreciated. Dr. Boileau had a good memory for detail, having travelled widely and read much. She had for every occasion an apt quotation, an appropriate illustration, or an amusing anecdote. She had a great gift for friendship and her loss will be deeply felt by a large circle of friends, people of many different classes and kinds.

THE LATE MR. H. D. FARNELL, F.R.C.S., O.B.E., J.P.

WE published last week a brief obituary notice of Mr. Henry Dawson Farnell. Since then we have received the following appreciations. The first, from Dr. A. Craigmile, is as follows: "Henry Dawson Farnell and I first met in the summer of 1875 at the Northern Hospital, Liverpool (now the David Lewis Northern Hospital), to which he came as senior house surgeon, and I as house physician; and so began a friendship which lasted without a break till now. Farnell had come straight from University College Hospital, where he had been under the influence of Marcus Beck—one of the junior staff. This young surgeon, shaking off the traditions of the London School, was struck by the reports of Lister's new antiseptic surgery, and had gone to Scotland to study under Lister himself. He returned full of enthusiasm for the new method, and so Farnell, inspired by Beck, with the sanction of his staff, introduced it to the Northern, and we were soon in the full swing of all Lister's ritual, as it then existed. Presently a marked change took place in the wards: suppuration disappeared, compound fractures healed kindly, and septicæmia and pyæmia were known no more, and so Farnell had the great honour of first introducing antiseptic surgery and Lister's methods to Liverpool.

The late Mr. Chauncy Puzey—one of our honorary surgeons—in his presidential address to the Liverpool Medical Institution many years after, paid a generous tribute to the work Farnell had done in this direction. Of his work in Eastbourne it is the province of others to speak. From the beginning we were drawn to one another by mutual tastes in many things, especially in literature and politics. He was a great admirer of Sir Walter Scott, and on holidays, spent together, he used to quote favourite passages and pithy sayings from his favourite novels, citing one incident after another. All who knew him well were aware of the interest he took in motoring to new places, where an old church with famous monuments and brasses and piscinæ was sure to claim his rapt attention, for he took the keenest pleasure in the history of his country and its old traditions, and knew nearly every cathedral well. He was ' the dearest friend and most unwearied spirit in doing courtesies '—ever loyal and unselfish and true to his principles wherever they might lead him."

Another colleague writes: "Farnell was not only a great surgeon, but a man to be trusted implicitly. His patients loved him for his tender care and unselfish devotion. In the prime of his life Farnell was a very type of mental and bodily vigour, and his energy was almost incredible. Even in the last months, when a certain failure of health necessitated some slacking off of labour, he stuck to such work as was possible ; on the very day of the seizure, which was to prove fatal in so short a time, he took his seat on the Bench—he had been a justice of the peace for nearly 20 years—and the first symptom of his illness occurred when he was parting from a patient. He thus died as he himself would have wished, 'in harness,' and has left a void in the profession which will indeed be hard to fill."

The Services.

CHANGES IN THE DIRECTORSHIP OF THE MEDICAL SERVICES.

IN July last Sir William B. Leishman took over from Sir John Goodwin the appointment of Director-General, A.M.S., resigning the Directorship of Pathology, in which he is succeeded by Colonel D. Harvey, while Major A. G. Rolleston is appointed Deputy Assistant-Director. On Oct. 1st Rear-Admiral Joseph Chambers will succeed Surgeon Vice-Admiral Sir Robert Hill as Director-General of the Medical Department of the Royal Navy. In the Indian Medical Service, as we announced on August 4th, Colonel Charles Harford Bowle-Evans became Director-General of Medical Services in place of Lieut.-General Sir C. H. Burtchaell, this being the first time that an officer of the I.M.S. has been appointed to be Director-General of Medical Services. At the same time the retirement of the Director-General, I.M.S., Sir William Rice Edwards, was announced ; he has been appointed representative of the Government of India on the Permanent Committee of the International Bureau of Public Health. This latter appointment was held by Major-General Sir Richard Havelock Charles, who has vacated office as president of the India Office Medical Board and medical adviser to the Secretary of State in Council, Major-General J. B. Smith taking his place.

ROYAL ARMY MEDICAL CORPS.

Capt. P. Carney retires, receiving a gratuity, and is granted the rank of Maj.

The undermentioned temp. Capts. relinquish their commns. and retain the rank of Capt. : A. St. J. Bateman, E. B. Jones, E. H. Milson, and M. Shipsey.

ARMY DENTAL CORPS.

Capt. R. W. Shortreed, late Spec. List, to be Capt.

RESERVE OF OFFICERS.

Lt.-Col. St. J. B. Killery having attained the age limit of liability to recall ceases to belong to the Res. of Off.

TERRITORIAL ARMY.

Capt. W. F. Denning (late 4th Bn., Duke of Wellington's Regt.) to be Major.

TERRITORIAL ARMY RESERVE.

The undermentioned officers having attained the age limit are retired and retain their rank : Lt.-Cols. A. L. Jones and W. McG. Young (with permission to wear the prescribed uniforms) ; Maj. W. T. Blackledge (with permission to wear the prescribed uniform) ; and Capt. W. J. C. B. Pitt.

The undermentioned relinquish their commns. and retain their rank : Capts. S. Sharples and W. Boyd ; Lts. A. L. Bastable and J. C. Jefferson.

Capt. F. D. Marsh, from General List, to be Maj.

General Hospitals : Lt.-Col. G. S. A. Ranking, having attained the age limit, is retd. and retains the rank of Lt.-Col.

INDIAN MEDICAL SERVICE.

Capts. R. H. Candy, Jamasji Cursetji Bharucha, H. Hingston, F. J. Anderson, and E. V. Morrison to be Majs.

ROYAL AIR FORCE.

Flight Lt. J. Paxton relinquishes his temporary commission on ceasing to be employed.

DEATHS IN THE SERVICES.

Surgeon-Captain Edward O'Malley, R.N., who died at Haslar Hospital on Sept. 20th, aged 51, was the son of the late Deputy Inspector-General O'Malley, R.N., and received his first commission in 1897. He saw service in the *Dido* during the Boxer rising, and was with the *Porpoise* in the Somaliland campaign. He served afloat with various ships of the Fleet during the Great War, and was only invalided out of the Navy 12 months ago. He leaves a widow but no children.

Medical News.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION.—Post-graduate courses in various specialties will be given during October in London. Beginning on Monday, Oct. 1st, there will be a course on urology at St. Peter's Hospital for Stone. Demonstrations will be given in the out-patient department every afternoon, and in addition lecture-demonstrations by members of the staff, at 2 P.M., four times a week. A course of eight lectures on the more important diseases of tropical countries will be given by Dr. Low and Dr. P. Manson-Bahr at the London School of Tropical Medicine, beginning on Tuesday, Oct. 2nd. A course in laryngology, rhinology, and otology will be given at the Central London Throat, Nose, and Ear Hospital from Oct. 8th to 26th ; clinical lectures and demonstrations will be given by members of the staff each day from 9.30 to 5 P.M. A course on children's diseases will be given at the Victoria Hospital for Children from Oct. 8th to Nov. 3rd, and special clinical instruction in ophthalmology will be available at the Royal London Ophthalmic Hospital during the whole of the month. From Oct. 15th to 27th short intensive courses in cardiology and proctology will be given at the National Hospital for Diseases of the Heart and St. Mark's Hospital respectively. A short course in dermatology will also be held at the Hospital for Diseases of the Skin, Blackfriars, from Oct. 29th to Nov. 10th, and a fortnight's " refresher " course in general medicine and surgery from Nov. 5th to 17th. Copies of the syllabus and full particulars regarding the above courses can be obtained from the secretary to the Fellowship of Medicine at 1, Wimpole-street, London, W., and as in some cases the numbers are limited, early application should be made.

GUY'S HOSPITAL BIENNIAL DINNER.—This dinner will be held at the Connaught Rooms, Great Queen-street, London, W.C., on Wednesday, Oct. 17th, at 7 P.M., Mr. G. Bellingham Smith presiding. The hon. secretary is Mr. Arthur W. Ormond, from whom further information may be obtained.

CENTRAL LONDON THROAT, NOSE, AND EAR HOSPITAL.—The winter session will commence on Thursday, Oct. 4th, at 4 P.M., when Mr. William Stuart-Low will deliver an address on the Rôle of the Mucous Membrane in Diseases of the Nose, Throat, and Ear.

NATIONAL HOSPITAL FOR THE PARALYSED AND EPILEPTIC, QUEEN-SQUARE, BLOOMSBURY, W.C.—The syllabus of the post-graduate course to be held from Oct. 8th to Nov. 30th has now been issued. The course will consist of lectures and demonstrations on the Pathology of the Nervous System on Mondays at 12 noon ; out-patient clinics on Mondays, Tuesdays, Thursdays, Fridays, 2 P.M. to 3.30 P.M. ; clinical lectures and demonstrations on the same days at 3.30 P.M. Dr. J. Godwin Greenfield will give a course of lectures and demonstrations on Neuro-Pathology on Mondays at 12 noon.

Medical Defence Union.—The annual general meeting of the Medical Defence Union will be held at the Royal Hotel, College Green, Bristol, to-day, Saturday, Sept. 29th, at 5 P.M., Sir Charles Ballance presiding.

Dr. Adam Patrick, of Glasgow, has been appointed Professor of Medicine at St. Andrews University in succession to Prof. A. M. Stalker.

St. Thomas's Hospital.—The old students' dinner will take place at the Princes' Restaurant, Piccadilly, on Oct. 26th, at 7 o'clock for 7.30. The chair will be taken by Mr. W. H. Battle.

Medico-Legal Society.—A meeting will be held at 11, Chandos-street, Cavendish-square, London, W., on Oct. 16th, when a paper will be read by Mr. W. Greaves-Lord, K.C., entitled Miner's Nystagmus, which will be followed by a discussion.

Medical Sickness, Annuity, and Life Assurance Society.—The annual general meeting of the company will be held at Lincoln House, 300, High Holborn, W.C. 1, on Oct. 1st, at 4 P.M. Among other business a proposal will be considered that the sum of £1 1*s.* should be paid to the chairman and each director for every attendance at the meetings of the board or of committees of the board and general meetings.

Pharmaceutical Society of Great Britain.—The opening of the eighty-second session of the school of pharmacy, 17, Bloomsbury-square, London, W.C., will take place on Oct. 3rd, when Dr. W. E. Dixon, F.R.S., will give the inaugural address at 3 P.M.

National Institute for the Blind.—The second "Sunshine House" for blind babies has been opened at Birkdale, Southport. Nearly five years ago the first home of the sort was established at Chorley Wood, Herts. Since then the home has always been full, while there has always been a long waiting-list of infants. The establishment and maintenance of these homes go far to relieve present misery and distress and to minimise the possibility of future hardships by creating the ability to overcome them.

Charing Cross Hospital Medical School.—The annual distribution of prizes will be held in the out-patients' hall of the hospital (entrance in King William-street) on Oct. 3rd, at 3.30 P.M. Dr. William Hunter will distribute the prizes and deliver an address entitled Some Problems of Modern Medical Education.

The *Annual Dinner of Past and Present Students* will take place on the evening of the same day in the Adelaide Gallery, Gatti's Restaurant, Strand, W.C., at 7 for 7.30 P.M., Dr. T. Watts Eden presiding. The guests present will include Lord Fairfax, Sir Donald Maclean, Sir Humphry Rolleston, and Prof. W. W. Chipman, of Montreal.

Psychological and Physical Development of the Child.—A series of six lectures for mothers on this subject will be held at Carnegie House, 117, Piccadilly. The lectures will be under the headings of the Baby (from birth to 5 years), the Child, and the Adolescent. The psychological aspect of infant life, childhood, and adolescence will be dealt with by Dr. H. C. Cameron on Nov. 6th, Dr. Niall on Nov. 13th, and Dr. Elizabeth Sloan Chesser on Nov. 20th; while the physical aspect will be discussed by Dr. Charles Anderson on Nov. 27th, Dr. Flora Shepherd on Dec. 4th, and Sir Bruce Bruce Porter on Dec. 11th. An introductory lecture by Dr. Crichton-Miller entitled the Well-meaning Mother on Oct. 30th, and a concluding one on Dec. 16th by Miss Smeeton, the Nurse and the Nursery, will complete the series. The lectures take place on Tuesdays at 3.15 P.M. Tickets (10*s.* 6*d.* for each lecture or £2 5*s.* for the series) may be obtained from Viscountess Erleigh, 65, Rutland-gate, London.

Donations and Bequests.—Mr. James Philip Bauer, of Manchester and Blackpool, left £1000 to the Manchester Royal Infirmary to endow a bed to be called the "James Bauer" bed; £100 each to St. Mary's and Southern Hospital, Ancoats Hospital, and many other bequests to Jewish charities in Manchester.—During the past month subscriptions and donations have been received by the Manchester Children's Hospital, totalling £1718, including donations from the Hospital Saturday Fund of £1388 and Salford Musical Festival of £95.—Local charities in Manchester have profited to the extent of £1613 from the result of the St. Leger Sweepstake in Rusholme: Manchester Royal Infirmary, £500; St. Mary's Hospitals, £400; Ancoats Hospital, £163; Rusholme Nurses Fund, £100; and some other institutions in proportion.

Cromer Cottage Hospital.—This well-equipped institution was presented to Cromer by the late Mr. G. W. Collison, and was opened on June 23rd, 1888. The hospital is a two-storied building, containing on each landing two large wards with eight beds in each, and two smaller wards for serious or operation cases, with two beds in each, the men's wards being on the ground floor, with an outside shelter for tuberculous cases, and the women's wards above, with a verandah opening out from the larger ward. The operating theatre is on the upper floor—a spacious apartment, about 21 feet by 20, with two large windows. For night operations an electric lamp is used and a new lamp is about to be installed at a cost of £50. The walls of the theatre are lined with glazed tiles, rounded off at all corners. A lift is installed. The hospital is provided with an X ray room, fitted up in June, 1913, by subscriptions from patients and well-wishers of Dr. H. C. Dent, on his retirement after 25 years' service. The resident staff consists of a matron, ward sister, and four probationer nurses. The medical staff is composed of the local medical men, Drs. R. Colvin-Smith, A. Burton and R. Grant, with two dental surgeons and a radiographer. Dr. F. W. Burton-Fanning, Norwich, is honorary consulting physician; Sir Hamilton Ballance and Mr. J. Burfield, of Norwich, honorary consulting surgeons, and Dr. A. J. Cleveland, Norwich, honorary consulting radiographer. The institution is supported by voluntary contributions, and fees are charged to patients as follows: Uninsured men and women, 10*s.* a week; insured men, 15*s.*, and insured women 12*s.* 6*d.* a week. Private patients are occasionally admitted at 3 guineas a week. The financial report for the year ending September, 1922, shows a balance of £153 4*s.* 10*d.* The medical report states that 262 patients were admitted during the year, 116 males and 146 females. Of these 245 were surgical cases, including 36 accidents, and 17 medical cases. Two hundred and six patients were discharged cured, 26 improved, and there were 17 deaths, and 11 patients remaining in the hospital. There were 95 X ray patients, hospital and private. There were 179 operations, including dental cases, and six operations under local anæsthesia. The daily average number of patients was 11, the average expenditure per patient £6 4*s.* 10*d.*, and the average expenditure per bed (20 beds) £81 15*s.* 5*d.*

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

MEETINGS OF SECTIONS.

Tuesday, Oct. 2nd.

ORTHOPÆDICS: at 5.30 P.M. (Cases at 5 P.M.)
Presidential Address:
Mr. R. C. Elmslie: Manipulative Surgery.
Cases: The following cases will be shown by:—
Mr. Elmslie: Deformity of Spine of Tibia.
Mr. Laming Evans: The Result of Combined Steindler and Whitman Operations for Talipes Calcaneo-cavus.
Mr. W. H. Ogilvie: Three cases of Primary Myositis.
Mr. P. Bernard Roth: Fracture Dislocation of Radius.
Mr. Maynard Heath: Recurrent Dislocation of Inner End of Clavicle.
Mr. Whitchurch Howell: (1) Tendon Transplant for Wrist-drop; (2) Tendon Fixation for Foot-drop.

Thursday, Oct. 4th.

OBSTETRICS AND GYNÆCOLOGY: at 8 P.M.
Specimens:
Mr. Alfred B. Danby: A Uterus removed for Concealed Accidental Hæmorrhage. (Cæsarean hysterectomy.)
Mr. Everard Williams: Adenomyoma in a Malformed Uterus.
Short Communications:
Dr. H. Williamson and Dr. G. F. Abercrombie: A case of Inversion of the Uterus caused by a Squamous-celled Carcinoma of the Fundus.
Mr. W. Gilliatt: Placenta Prævia in Three Successive Pregnancies.
Paper:
Mr. Gordon Luker: Treatment of Puerperal Septicæmia. (A new method.)

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith-road, W.
Monday, Oct. 1st.—10 A.M., Mr. Maingot: Surgical Pathology. 12 noon, Mr. Simmonds: Applied Anatomy. 2.30 P.M., Dr. Saunders: Medical Wards.
Tuesday.—11 A.M., Dr. Paterson: Medical Wards. 12 noon, Dr. Burrell: Chest Cases. 2 P.M., Mr. Banks-Davis: Throat, Nose, and Ear Dept.

Wednesday.—10 a.m., Dr. Saunders: Medical Diseases of Children. 12.15 p.m., Dr. Burnford: Medical Pathology. 2 p.m., Dr. Pernet: Skin Dept.

Thursday.—10 a.m., Dr. Grainger Stewart: Neurological Dept. 12 noon, Mr. Simmonds: Demonstration of Fractures. 2 p.m., Mr. Bishop Harman: Eye Dept.

Friday.—10 a.m., Mr. Dudley Buxton: Dental Dept. 12 noon, Dr. Endean: Venereal Diseases. 2 p.m., Mr. Sinclair: Surgical Out-patients.

Saturday.—9.30 a.m., Dr. Burnford: Bacterial Therapy. 10 a.m., Dr. Saunders: Medical Diseases of Children. 10 a.m., Mr. Banks-Davis: Operations on Throat, Nose, and Ear.

Daily, 10 a.m. to 6 p.m., Saturday, 10 a.m. to 1 p.m., In-patients, Out-patients, Operations, Special Departments.

ST. MARY'S HOSPITAL MEDICAL SCHOOL POST-GRADUATE COURSE.

Monday, Oct. 1st.—11 a.m., Mr. Aleck Bourne: Anticipation of Mechanical Difficulties in Labour, illustrated by lantern slides. 12 noon, Dr. Wilfred Harris: Encephalitis Lethargica. 2 p.m., Dr. Graham Little: Diagnosis of Some Common Diseases of the Skin, illustrated by cases. 3 p.m., Prof. F. Langmead: Some Functional Disorders in Young Children.

LIVERPOOL UNIVERSITY CLINICAL SCHOOL.

(At 3.30 p.m. each day.)

Monday, Oct. 1st.—(At the Children's Hospital.) Dr. Fordyce: Glycosuria: (1) Cases of Diabetes Mellitus under Treatment with Insulin; (2) Cases of Non-diabetic Glycosuria, Diagnosis, Tests, Treatment.

Tuesday.—(At the Southern Hospital.) Mr. Douglas-Crawford: Common Surgical Lesions of the Jaw.

Wednesday.—(At the Northern Hospital.) Dr. Bligh: Types of Mental Defects in Children.

Thursday.—(At the Stanley Hospital.) Dr. Gullan: Diseases of the Endocrine Organs—notably Thyroid Gland, Pancreas, and Suprarenal Gland.

Friday.—(At the Royal Infirmary.) Dr. Abram: Clinical Medicine.

MANCHESTER ROYAL INFIRMARY POST-GRADUATE CLINIC.

Tuesday, Oct. 2nd.—4.15 p.m., Dr. F. E. Tylecote: Some Recent Abdominal Cases.

Friday.—4.15 p.m., Dr. Judson S. Bury: The Regional Diagnosis of Paralysis.

Appointments.

Ash, W. M., M.B., B.S. Lond., D.P.H., has been appointed Deputy Medical Officer of Health for the County of Middlesex.

Berry, R. B., M.D., Ch.B. Vict., D.P.H., Medical Officer of Health for Gloucester.

Rowan, J., M.B., C.M. Glasg., an additional Ophthalmic Specialist Medical Referee under the Workmen's Compensation Act for the Sheriffdom of Lanark.

Stansfield, Tom, M.B., B.S. Lond., Hon. Assistant Physician to the Royal Berkshire Hospital, Reading.

Turner, Mary I., M.B., Ch.B. Vict., D.P.H., Assistant M.O.H., Chester.

Certifying Surgeons under the Factory and Workshop Acts: **Lees, J. A.**, M.B., Ch.B. Vict. (Rawtenstall); **Bartlett, J. H.**, L.R.C.P. Edin., L.R.F.P.S. Glasg. (Harrold District of Bedford); **Carson, C. O.**, L.R.C.P. Lond., M.R.C.S. (Lydney).

Vacancies.

For further information refer to the advertisement columns.

Bristol Royal Infirmary.—Hon. Dental Surgeon.

Central London Throat, Nose, and Ear Hospital, Gray's Inn-road, W.C.—Three Registrars.

Croydon Borough Sanatorium, North Cheam.—Res. Med. Supt.

Croydon General Hospital.—Jun. H.S. £150.

Derbyshire Royal Infirmary, Derby.—Two H.S.'s., H.P., &c. Each £200.

Duff House Private Hospital, Ruthin Castle, North Wales.—Res. Asst. P. £300.

Egyptian Government School of Medicine.—Lecturer in Experimental Physiology. L.E.540 a year.

Guildford, Royal Surrey County Hospital.—H.S. £150.

Hospital for Consumption and Diseases of the Chest, Brompton, S.W.—H.P. Also Res. M.O. £500.

Hospital for Sick Children, Great Ormond-street, W.C.—H.P. and Asst. Cas. O. £50. H.S. £50.

Hull City Asylum.—Jun. Asst. M.O. £300.

Italian Hospital, Queen-square, W.C.—Asst. Anæsth.

King's College Hospital.—Clin. Assts. Med. and Surg. Out-patient Officers. Sambrooke Med., Surg., and Obstet. Reg.

Kingston-upon-Hull City and County.—R.M.O. £400.

Leeds Public Dispensary.—Jun. Res. M.O. £150.

London Lock Hospital, 91, Dean-street, W.—H.S. £200.

Middlesex Hospital, W.—Radium Officer. £300.

Mount Vernon Hospital for Diseases of the Chest, Northwood, Middlesex.—Asst. Phys.

Newcastle-upon-Tyne City Hospital for Infectious Diseases.—Res. Med. Asst. £350.

Norwich, Norfolk and Norwich Hospital.—Hon. S.

Oswestry, Shropshire Orthopædic Hospital.—Res. Surg. O. £500. Two H.S.'s. £250.

Paddington Green Children's Hospital, W.—H.P. and H.S. Each £150.

Prince of Wales's General Hospital, Tottenham, N.—H.S. £150. H.P. £150. Also Jun. H.S. and Jun. H.P. £110 each.

Royal Eye Hospital, St. George's Circus, Southwark, S.E.—Hon. Asst. S. Also Jun. H.S. £75.

Royal Free Hospital, Gray's Inn-road, W.C.—Cas. O. £100.

St. Pancras Metropolitan Borough.—M.O.H. £1100.

South London Hospital for Women, Clapham Common, S.W.—Temp. Asst. P.

South Mimms, Barnet. Clare Hall Hospital and Sanatorium.—Asst. M.O. £350.

Staffordshire General Infirmary, Stafford.—H.P. £150.

West Bromwich and District Hospital.—Res. Asst. H.S. £180.

Western Ophthalmic Hospital, Marylebone-road, N.W.—Sen. and Jun. H.S.'s. £150 and £100 respectively.

York, North Riding Mental Hospital.—Temp. Asst. M.O. 7 guineas weekly.

The Chief Inspector of Factories, Home Office, London, S.W., announces a vacant appointment at Wirksworth, Derbyshire.

Births, Marriages, and Deaths.

BIRTHS.

Brewerton.—On Sept. 23rd, at Harley-street, W., the wife of Elmore Brewerton, F.R.C.S., of a daughter.

Gilmour.—On Sept. 17th, at Dora-road, Wimbledon Park, S.W., the wife of Dr. A. Gilmour, of a son.

Macrae.—On Sept. 20th, at Edwardes-square, Kensington, the wife of Captain A. Campbell Macrae, I.M.S., of a daughter.

Neighbour.—On Sept. 19th, the wife of Dr. Philip Neighbour, of Feltwell, Norfolk, of a daughter.

MARRIAGES.

Banfield—Osborn.—On Sept. 20th, at St. Mary's the Virgin, Dover, by the Revd. Canon Elnor, Capt. E. L. Banfield, *M.C.*, Royal Irish Fusiliers Reserve of Officers, eldest son of Mr. R. Banfield, O.B.E., Deputy Chief Constable of Cornwall, and Mrs. Banfield, of Bodmin, to Hylda Gwynedd (Nancy), second daughter of Dr. F. A. and Mrs. Osborn, of Clyde House, Dover.

Firman-Edwards—Anderson.—On Sept. 15th, at St. John's Church, Coulsdon, Surrey, Langdon Firman-Edwards, M.B. Cantab., to Hylda, younger daughter of Mr. and Mrs. C. Labat Anderson, The Durdans, Purley, Surrey.

DEATHS.

Boileau.—On Sept. 17th, Margaret Lucy Augusta Boileau, M.B., B.S., daughter of the late Sir Francis Boileau, Bart., of Ketteringham Park, Norfolk, aged 56 years.

Maguire.—On Sept. 20th, at Stony Stratford, Bucks, Thomas S. Maguire, M.D., J.P., aged 78.

O'Malley.—On Sept. 20th, suddenly, at Haslar Hospital, Surgeon-Captain Edward O'Malley, R.N. (retired), of St. Ronans-road, Southsea.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

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THE POSITION OF THE FRIENDLY SOCIETIES.

THE following is an abstract from the presidential address delivered by Mr. T. W. Huntley (Newcastle-upon-Tyne) at the National Conference of Friendly Societies held at Aberystwyth on Sept. 20th–22nd.

The question of the moment, said Mr. Huntley, was the new contract to be made with the doctors. The pre-war fee was 7*s.* 3*d.* per insured person per annum. After a demand from the doctors an arbitration award given early in 1920 raised the fee to 11*s.*, the difference being provided by an Exchequer grant and not by Health Insurance funds. A reduction of the fee to 9*s.* 6*d.*, effected in 1922, was to continue till Dec. 31st. After the issue of the Geddes Report on national expenditure, the Cabinet accepted a recommendation for the abolition of the Exchequer grant for medical service, and decided to introduce a bill to raise the contributions of the insured persons and employers. The proposal was strenuously opposed by the Consultative Council, on the ground that the time was inopportune for raising contributions, and the Council made a suggestion, which was accepted, that the amount required to maintain the contract with the doctors from April 1st, 1922, to Dec. 31st, 1923, should be borne by the accumulated funds of the approved societies.

Three points emerged from this position: (1) The possibility of a return to the pre-war per capitation fee of 7*s.* 3*d.* was clearly contemplated; (2) more than 7*s.* 3*d.* could not under any circumstances be paid from insurance funds without the full knowledge and approval of approved societies; (3) no repudiation by the Ministry of this condition had been made, but on the contrary Sir Alfred Mond, the then Minister, agreed to consult the approved societies.

Position of the Doctors.

The doctors' contentions, Mr. Huntley went on to say, were as follows: 1. The reduction of the capitation fee from 11*s.* to 9*s.* 6*d.* was agreed to on patriotic grounds and in ignorance of the fact that the insurance funds would bear the charge. 2. There were no grounds for a reduction of the present fee of 9*s.* 6*d.*, but there were reasons for an increase to 10*s.* 4*d.* and more. 3. The insurance funds were accumulating by millions a year and could carry a higher medical fee, and the fee should be a first charge upon the funds.

Criticism of Doctors' View.

In criticism of these contentions Mr. Huntley said that seeing that the additional payment was to be met by Exchequer grant they were not a party to the award of 11*s.*, but its grant caused them some surprise, and the Minister of the day said it was too high. To say that there was no ground for a reduction now was to ignore the fall in the cost of living since early in 1920, but many thousands of other people had not been allowed to ignore it. Nor could the following facts be overlooked: (1) That the original fee of 7*s.* 3*d.* was greatly in excess of what was received for club practice in pre-insurance days; (2) that no attempt had been made by reference to number of attendances per insured person or other statistics to prove that the fee is not a fair remuneration for the services rendered; (3) that the 7*s.* 3*d.* capitation fee gave an augmentation to the income of a large number of the profession such as no other circumstance has ever done and raised permanently their standard of living—that, in short, the doctors had done exceedingly well out of health insurance.

The claim that because the insurance funds were growing the present per capita fee, or a higher one, could be paid, and that this should be first charge on the funds, could not be admitted by any student of insurance. It meant the Act for the doctors, not the doctors for the Act. Of course the funds were growing, but with reference to the surpluses declared at the last valuation they could not overlook the actuary's warning that these had arisen through circumstances which could not be expected to be repeated—the abnormal death-rate of members of military age and the consequent premature release of reserves and high rates of interest.

Negotiation or Resistance.

It was their great desire to live and work in amity with the members of the medical profession. Theirs was a noble calling, and it was right to say that in the main panel doctors had given good service under their contracts. The Friendly Societies were not out for an underpaid medical service, but they did not think the original payment was less than the value of the service rendered. If the doctors could secure more from other sources they would assume the same attitude of non-intervention as before. The situation was not one for dictation by doctors and the societies must not falter in defending their members. They were prepared to negotiate, but if it was proposed to distribute beyond the present statutory limits any part of the funds for which they were trustees, without their full knowledge and agreement, then they would offer the most determined resistance.

A Resolution.

The Conference later passed a resolution to the effect that the sum paid from the funds of approved societies to insurance panel practitioners at the period when the agreement was terminated by the Government, on the recommendation of the Geddes Committee, was ample for the services rendered, and that no increase beyond 7*s.* 3*d.* per insured person payable out of approved societies' funds could be agreed upon without the consent of the societies.

A MATERNITY NURSING HOME ON HOSPITAL LINES.

MEDICAL men are often asked to name suitable homes to expectant mothers of the middle classes who wish to be confined away from their homes. The privilege of residing in the same house as her accoucheur has hitherto been largely confined to the class of women who use the big maternity and lying-in hospitals. Our attention has been drawn to Stone Field, Kidbrook-grove, Blackheath, London, S.E. 3, which is a large private house adapted as a maternity nursing home with two resident obstetricians and a staff of nurses holding the C.M.B. certificate. The home has 20 beds arranged in private rooms (7 to 11 guineas a week) and cubicles (6 guineas a week), these charges including motor service, patients being fetched free of charge from London and neighbouring districts, the service working day or night as required. Medical accouchement outfit is also provided free. With regard to medical fees, patients make arrangements with one of the residents or with their own doctor, who may conduct the confinement if it is desired. The house has spacious rooms and an attractive garden. Further particulars can be obtained from the matron of the home.

PUBLIC HEALTH IN BIHAR AND ORISSA.

(Concluded from p. 636.)

The Effect of Improved Agricultural Conditions on Crime.

IN the jails [1] of this province there was a considerable decrease in the numbers confined, from a total of 51,272 in 1920 to 42,290 in 1921, the average daily population being 5990, against 7845 in the previous year. The decrease is attributed by Colonel Sir H. E. Banatvala, C.S.I., I.M.S. (retired), Officiating Inspector General, to improved agricultural conditions, as shown by the large decrease (2423) in the offences against property; and in convictions for dacoity, which had been 361 in 1919 and 179 in 1920, but were only 111 in the year under report. The majority of the convicts were Hindus, but in proportion to the numbers of the free population in the province Mohammedans contributed 0·408 per 1000, Hindus 0·298, and Christians 0·227 per 1000. Of the total, 91·17 were illiterate. There was a considerable decrease in the number of youthful or juvenile offenders (under 20 years of age), from 855 in 1920 to 644 in 1921. Sir H. Banatvala remarks, very truly, that "it is unfortunate that we were obliged to keep in our juvenile jail boys under 16, lads of 16, and adolescents up to 21 years of age—all mixed together." He points out that 58 juveniles (under 16) were sentenced to from 2 to 15 days imprisonment, mostly for offences against property. "What useful purpose can be served by sending boys to a jail for such short periods I cannot imagine, and I think magistrates would exercise a sound discretion by availing themselves of Section 562, Criminal Procedure Code, or by releasing them after whipping—i.e., where allowed by law." It is to be hoped that this opinion will receive the attention it deserves. There is no doubt that juvenile offenders may receive very great and lasting benefit when undergoing terms of imprisonment long enough for the good influences brought to bear upon them to produce their effect; but time is required.

With regard to the health of the prisoners, the ratios of admission to hospital and average daily sick were 1163·0 and 48·9 per 1000, as compared with 885·6 and 42·1 in 1920. The death-rate also increased from 27·0 to 31·0, but this was below the mortality for the province (32·8). Gaya jail had the highest death-rate (74·1), a considerable increase over that of the previous year (55·9), due to cholera (11 deaths) and tubercle (13). At Cuttack the mortality was 50·2, compared with 14·6 in 1920, due chiefly to dysentery. There was an increase in cholera (32 cases and 14 deaths, against 13 and 5 in 1920); 23 cases occurred at Gaya (11 fatal). On the other hand, dysentery, so generally a scourge in jails, though causing 850 admissions to hospital, was fatal in only 24 cases (against 858 and 52 in 1920).

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[1] Patna Government Press, 1922.

In many instances the predisposing cause is hookworm infection, with which parasite "the average percentage of infection in this province is about 70." Malaria caused 1302 admissions to hospital, but only 3 deaths (255·4 and 0·5 per 1000). For pulmonary tuberculosis there were 87 admissions and 35 deaths. Of the whole number of 14,284 convicts discharged during the year from the Central and Districts jails, 60 per cent. gained and only 16 per cent. lost weight, a most satisfactory result from the public health point of view.

Report on Vaccination.

The Report on Vaccination [2] for 1921–22, by Lieut.-Colonel W. C. Ross, states that the total number of operations performed fell from 1,060,485 in the previous year to 939,851 during the period now reviewed (April, 1921, to March, 1922). The decrease is attributed to political unrest and active interference with the work of the staff: "the vaccinators are now unwilling to work in many places, and their numbers are likely to decrease, as they cannot realise their fees fully." Of the total operations (925,134) performed by the staff, 98·26 per cent. were successful. The small-pox mortality in the province during the last five years has amounted to 55,691, while in the preceding quinquennium it had been 40,437. Colonel Ross considers that the disease cannot be "effectively dealt with and stamped out unless vaccination is made compulsory throughout the province"; he would recommend that the age should be extended to one year, that vaccination should be free, and that the supervision should be delegated to district boards and municipalities.

Hospitals and Dispensaries.

During the year 1921 25 hospitals and dispensaries [2] were opened in Bihar and Orissa, and five were closed, the total number of these institutions at the end of the year being 454; moreover eight new dispensaries have been added during 1922. This progress is encouraging and satisfactory. The report states that "it is hoped to carry through the ideal scheme of having a dispensary for each *thana* [police station] or for an area of each five square miles, in which area the medical officer of the dispensary will be responsible for the sickness of his area." As the area of the province is 83,181 square miles, this would mean 16,636 hospitals or dispensaries; probably "for each five miles square" is intended, which would mean 3327 institutions. "The great point is to have a medical officer who can reach at once the spot where epidemic disease breaks out, and so deal with it in the earlier stages, when it is possible to take effective action." This is undoubtedly a true economy in every way; *obsta principiis.* It is unfortunate that there is difficulty in getting doctors of the sub-assistant surgeon class, who at present prefer to avoid Government service; the cadre is always under strength. Altogether 4,003,991 patients were treated in 1921 at the various hospitals and dispensaries in the province, of which total 67,850 were in-patients; in 1920 the corresponding numbers had been 3,851,953 and 67,095. In the "State-Public, Local Fund, and Private-Aided Hospitals and Dispensaries" the total number treated was 2,962,623; the daily average of in-patients being 1781 and of out-patients 17,873. There was an increase in cholera mortality in the general population from 0·7 (in 1920) to 2·6 per 1000; the dispensary attendance rose from 4487 (with 605 deaths) to 12,230 (and 622 deaths) in 1921. "Until the rudiments of sanitation are thoroughly appreciated by the people, so long will the water-supplies of small towns and villages become infected on the return of villagers from cholera-infected parts. . . . All these matters require special consideration in the establishment of a public health organisation, which is urgently needed for the prevention of epidemic disease." As to plague, of which 1657 cases were treated, against 2161 in the previous year, "there is little that can be done with conditions as they are in Indian towns and villages." The people understand and appreciate the evacuation of houses, but what is required are rat-proof houses and grain-stores, and anti-plague vaccination. Small-pox admissions fell from 1532 in 1920 to 488 in 1921, but malaria increased from 755,423 to 824,252; owing to the increased cost of quinine it is impossible to obtain enough to allow it to be used in effective doses. There was some increase in pulmonary tubercle (6051 admissions and 143 deaths, compared with 5699 and 127 in 1920); intravenous injection of sodium morrhuate has given good results. There was also an increase in kala-azar (12,423 cases, against 8520 in 1920, and 5281 in 1919); treatment by intravenous injections of tartar emetic is much appreciated, and has no doubt led to an increase of admissions. In the eight leper asylums there were 1967 resident patients, compared with 1852 in 1920; this does not necessarily mean that leprosy is on the increase, but indicates that the lepers recognise the benefits of treatment. It is proposed to form a leper colony in the Santal Parganas (Bhagalpur Division), with the aid of the Santal Mission, to which a debt of gratitude will be due for this excellent scheme. A new radium institute has been built at Ranchi, and work in this direction has already been started by Lieut.-Colonel J. C. S. Vaughan, I.M.S. (retired), who is an expert in this treatment.

Progress is reported in many other directions, including improvement in maternity methods, the establishment of a medical college, and the introduction of post-graduate courses for assistant surgeons. Colonel Austen Smith, C.I.E., Inspector-General of Civil Hospitals, concludes his report by referring to the scheme for post-graduate courses for assistant and sub-assistant surgeons now in operation at the Calcutta Medical College, which will ensure their being kept up-to-date with medical science; and hopes that the pay and prospects of sub-assistant surgeons in the province will be improved, "as they are a very deserving body of Government servants, and I wish to see them a contented service."

THE TREATMENT OF WHOOPING-COUGH WITH ARTIFICIAL SUNLIGHT.

Dr. Ferdinand Schotten,[1] of Cassel, has succeeded in relieving the distressing condition of the paroxysmal cough followed by vomiting which makes the nursing of whooping-cough such a trial to parents. He reports 10 cases, all between the ages of 1 and 5 years, and all in the stage between the eighth and fourteenth days after the first attack of coughing, that is between the catarrhal and convulsive stages, the most distressing period for the mothers. The children all had marked mucous expectoration and frequent paroxysms. The children were submitted to artificial sunlight with the chest exposed for five minutes every two days, the exposure increasing by three to five minutes each time. All the cases reacted promptly, and after three to four treatments the attacks became less frequent, especially during the night, when the children were suddenly awakened by an irritation in the throat, had to sit up, and finished by vomiting. Dr. Schotten does not think that pertussis can be cured by this treatment, but by reducing the attacks of vomiting the child feels better, the appetite improves, nourishment can be maintained, and weight is not lost. It is recognised that after whooping-cough the glands in the hilum of the lung become swollen, and remain so for a long period, and that tuberculosis often supersedes the disease. Dr. Schotten suggests that by improving the general condition of the patient the swelling of the glands may be prevented from becoming chronic and from forming a medium for other infections.

THE SPAS OF WESTERN ENGLAND AND CENTRAL WALES.

The Great Western Railway Company have issued an attractive little booklet summarising the therapeutic advantages of the various spas and health resorts served by their lines [2] in the West of England and in Central Wales. In an introduction to the booklet the effect of the recent war upon the British spas is traced, and reference is made to the improved facilities for travel, hotel accommodation, and entertainment, which now enable these resorts to compete on equal terms with those of the Continent. Treatment at a British spa is now within reach of many people for whom visits to continental resorts are out of the question, and the comparative cheapness and ease of travel to the former are here emphasised. The spas dealt with are Bath, Cheltenham, Church Stretton, Droitwich, Leamington Spa, Malvern, Torquay, Weymouth, Builth Wells, Llangammarch Wells, Llandrindod Wells and Llanwrtyd Wells. Two or three pages of historical and geographical description, with notes of the type of cure practised, and in many cases with analyses of the waters, are included in regard to each of the places named; good illustrations and a summary of the specific therapeutic benefits obtainable enhance the value of this little publication.

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Messrs. John Knight and Sons, of 26, Cale-street, Chelsea, S.W. 3, have sent us particulars of a combined W.C. trap, and soil-pipe branch which is carried through the wall of the house. There are no joints to either drain or soil-pipe within the house, and as the trap is fixed clear of the floor the space beneath the pan can be easily kept clean. The pipe branches are made for 9 in., 14 in., and 18 in. walls.

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[2] Annual Returns for 1921. Patna Government Press, 1922.

[1] Deutsche med. Wochenschrift, August 31st, 1923.

[2] Inland and Marine Spas on the Great Western Railway. Published by the Company, Paddington Station, London, W. 2.

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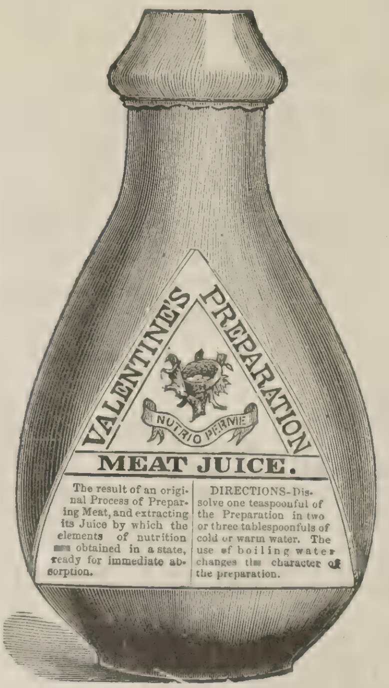

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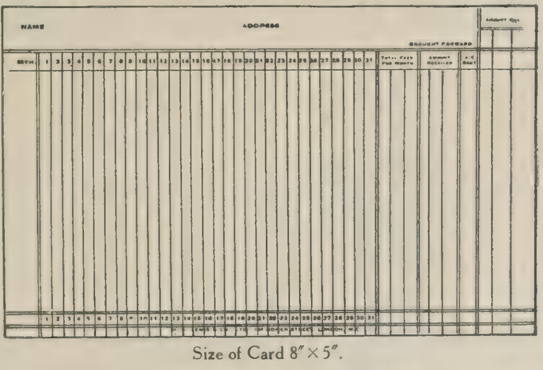

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> "The London Medical Exhibition . . . . has matured by process of time into a most interesting display of the products of applied scientific work. Each succeeding year its claims have appealed more strongly to the members of the medical profession owing to the sincere and indefatigable efforts of its promoters to make it a real demonstration of surgical, medical and pharmaceutical advances. The reproach against it from some quarters that it is the mere fulfilment of a trade purpose may be dismissed in view of the close interest taken in the proceedings by the large number of professional men who attend. It seems evident that they go because they welcome the opportunity of making a near-at-hand inspection of what is being done to insure that medical accessories should contribute in the closest way to successful treatment. The exhibition affords, in fact, a very convenient channel for presenting to medical men, particularly in the metropolis, the interesting developments in pharmacy, medical, surgical and sanitary appliances, special dietetics, and so forth, which take place year by year."

"The Medical Press," October 11, 1922, said:—

> "With every succeeding year the evidence becomes more manifest that the annual London Medical Exhibition meets with increasing appreciation from the medical profession. That is not surprising, because the organisers of the Exhibition, being closely identified with the profession, are in the position to judge what is required for the purpose. Their enterprise is never lacking; their arrangements are always up to date and perfect; they aim at making the re-union of practitioners pleasant and, above all, profitable. With success has come the power to exercise an exclusiveness in respect of the exhibits, and by this means the standard of the Exhibition as a whole has been raised. *Hence there is nothing of the kind in this country able to compete with it in design, in popularity and in effectiveness.* So far as the exhibiting firms are concerned, the opportunity is valued as a special occasion for bringing under the direct notice of the profession the newest thing in pharmacy, in instruments, and in the allied branches of the trade which cater for medical requirements. The fact that this is so has now become recognised, and has much to do in accounting for the large attendances of consultants, specialists, and members of the profession generally which these exhibitions annually attract. The success attained this year was greater than on any previous occasion."

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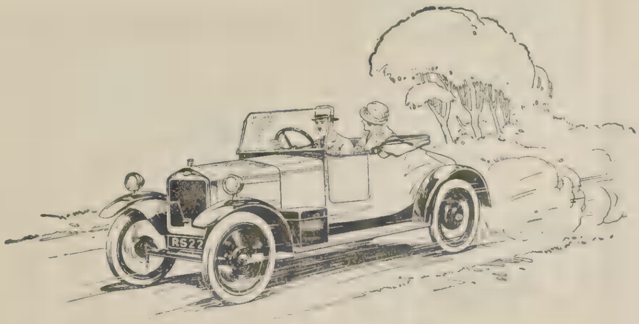

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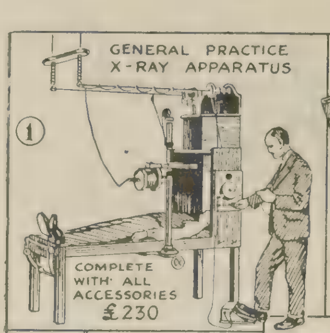

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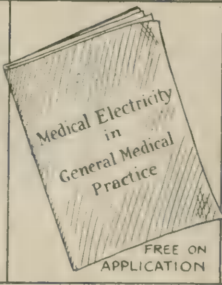

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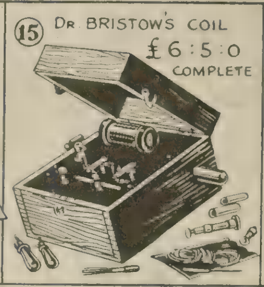

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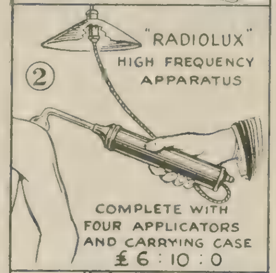

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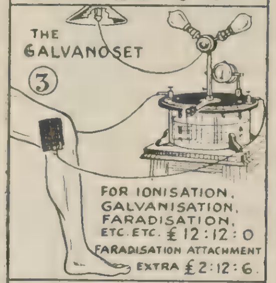

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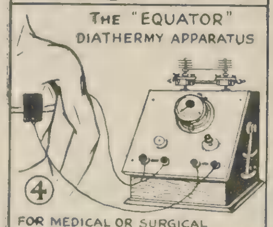

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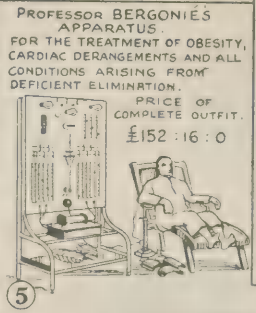

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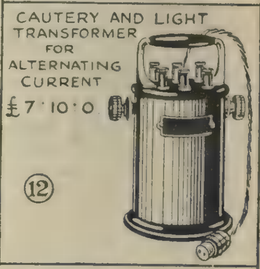

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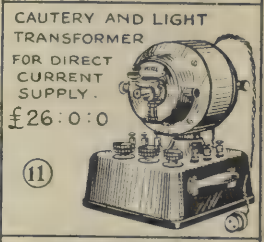

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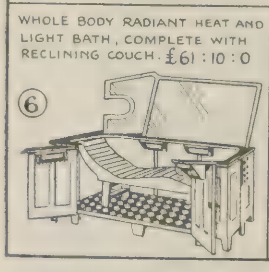

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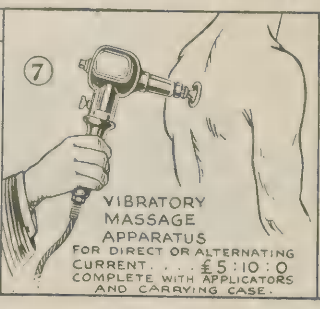

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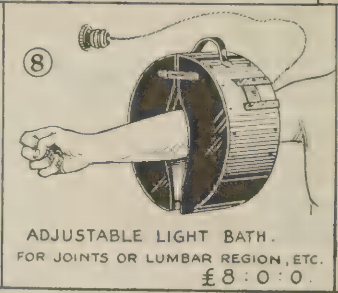

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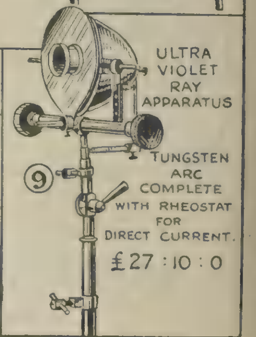

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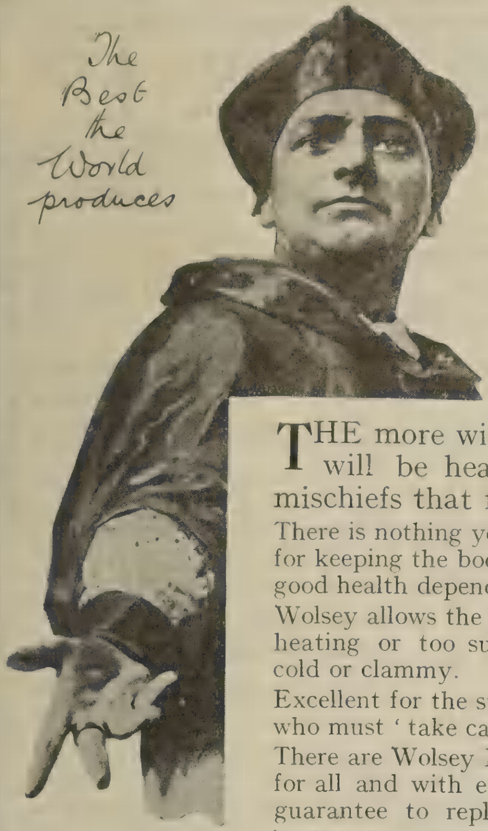
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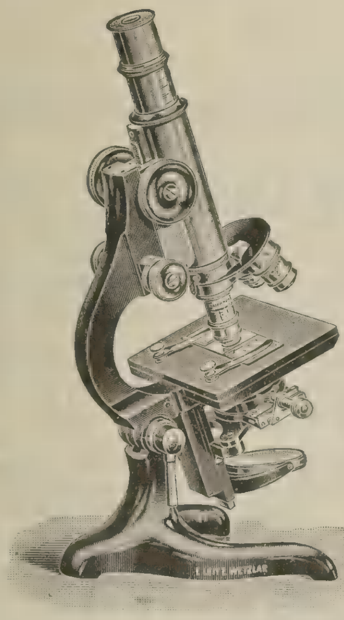

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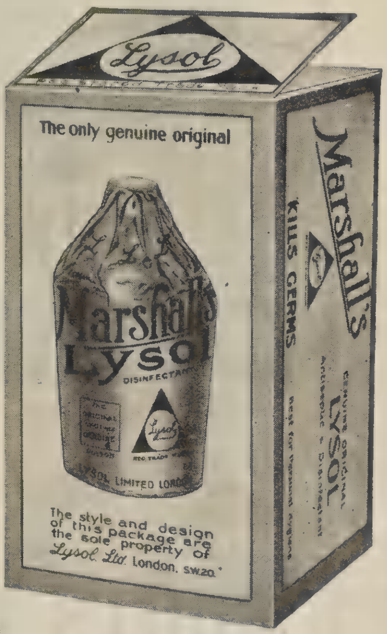
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Carbohydrates & Non. Nitro. Ext. Matters	67·81%
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Moisture ..	23·28%
Carbohydrates & Non. Nitro. Ext. Matters	27·38%
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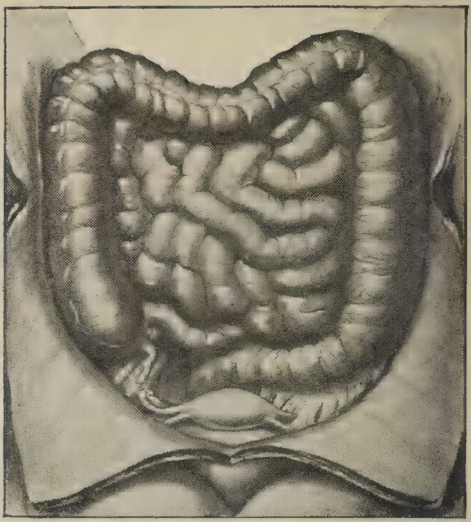
M.5

Spastic bowel; *(a)* showing ulcerations

Dyschezia due to fecal impaction



Atony due to sigmoidal adhesions

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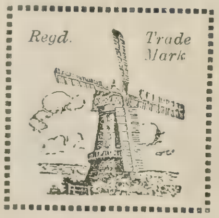

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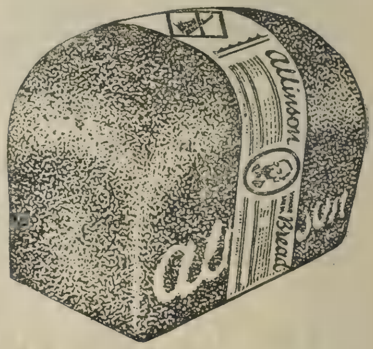

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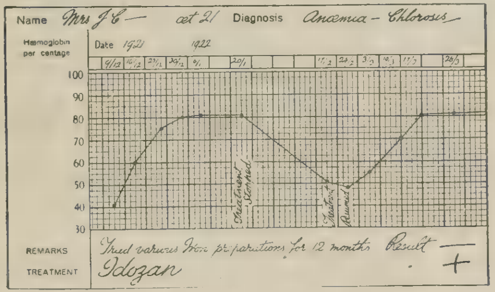

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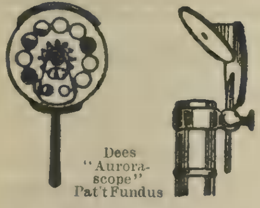

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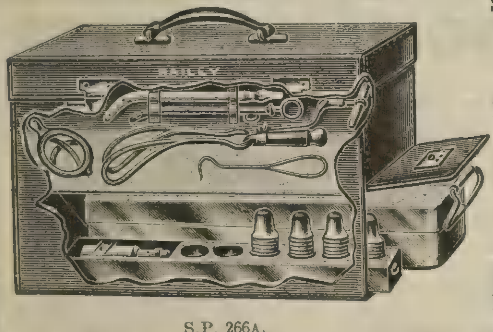

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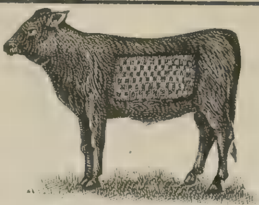

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Director of Dental Studies: A. LIVINGSTON, M.B., Ch.B., M.D.S.

Lecturer in Dental Mechanics	J. Bell Milne, L.D.S. Edin.
Lecturer in Orthodontics ..	G. F. Cale Matthews, L.D.S. R.C.S. Eng.
Lecturers in Operative Dental Surgery	W. E. Coe, L.D.S., D.M.D. John James, L.D.S.R.C.S. P. Lloyd Williams, M.R.C.S., L.D.S.
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Full information may be obtained from the Secretary to the Medical School, S. C. RANNER, M.A., King's College Hospital Medical School, Denmark Hill, S.E. 5.

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Assistant: M. E. DELAFIELD, M.B., L.R.C.P., D.P.H.

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BACTERIOLOGY AND PARASITOLOGY	Prof. HEWLETT and Dr. TAYLOR.
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During a period of four weeks, commencing in November, a course in the subject of Part I. will be given at King's College if there are sufficient entries.

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Special Courses in School Hygiene, in Maternity and Child Welfare Service at the School and Municipal Clinics (Dr. Laird and Assistants); in Tuberculosis Service (Dr. Varrier-Jones and Dr. Philip); in Venereal Diseases at Addenbrooke's Hospital (Dr. Aldren Wright and Dr. Charles Searle).

The last examinations under the present regulations will be in April and October, 1924. Courses of study under new regulations will commence 10th October, 1924.

Further particulars may be obtained from Mr. J. E. PURVIS, Public Health Chemical Laboratory, Cambridge.

Manchester Royal Infirmary.—

Post-Graduate Lectures will be given by the Honorary Staff in Medicine, Surgery, and Special Subjects each week on TUESDAYS, from OCTOBER 2ND, 1923, till DECEMBER 18TH, and will be continued from JANUARY 29TH, 1924. In addition Short Courses explaining recent scientific work will be given on FRIDAYS, from OCTOBER 5TH till DECEMBER 7TH. All the Lectures will begin at 4.15 P.M., and will be free. Details may be obtained from the Secretary for the Post-Graduate Lectures.

King's College Hospital Medical
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Introductory Address at 2.30 P.M. by H. J. Waring, Esq., M.S., F.R.C.S., Vice-Chancellor of the University and Vice-President of the Royal College of Surgeons of England; the Rt. Hon. the Viscount Hambledon will preside.

The Past and Present Students' Dinner will be held the same evening at 7 for 7.30, at the Connaught Rooms, Great Queen-street, W.C. 2, Professor Arthur Whitfield in the chair. The Secretaries to the Dinner Committee are Dr. Ernest Playfair and Dr. G. de Bec Turtle.

The Calendar of the School, giving information as to Prizes, Entrance and other Scholarships, &c., may be obtained, post free, on application to the Dean, H. Willoughby Lyle, M.D., B.S. Lond., F.R.C.S., or to S. C. Ranner, M.A. Cantab., the Secretary of the School.

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A HOUSE licensed for the reception of a limited number of ladies of unsound mind. Both certified and voluntary patients received. This is a large country house with beautiful grounds and park, five miles from Sheffield. Station, Grange Lane, G.C. Railway, Sheffield. Telephone No. 34 Rotherham.

Resident Physician—GILBERT E. MOULD, L.R.C.P., M.R.C.S.
Consulting Physician—CROCHLEY CLAPHAM, M.D., F.R.C.P.E.

THE CHESTNUTS,

St. Pauls Cray Road, CHISLEHURST.

HIGH-CLASS HOME FOR MENTAL AND MEDICAL PATIENTS

Large house, own grounds, strictly private, high, healthy, adjoining 300 acres noted woods and commons.

Individual attention given by fully trained staff under Lady Superintendent (fully trained and well-known to London Specialists).

Telephone: 154 Chislehurst. *Station:* Chislehurst, S.E. & C.R.

Apply, Lady Superintendent—**Mrs. Armstrong.**

CLARENCE LODGE

CLARENCE ROAD, CLAPHAM PARK

A limited number of Ladies suffering from MENTAL & NERVOUS DISORDERS are received for treatment under a Specialist.

The house stands in large grounds.

For further particulars see Illustrated prospectus from the Proprietress, Mrs. THWAITES. Telephone: Brixton 494.

WYE HOUSE, BUXTON.

FOR THE TREATMENT OF LADIES AND GENTLEMEN **MENTALLY AFFLICTED.**

Voluntary Boarders received. Situated 1,200 ft. above sea level facing S.; 11 acres of ground.—For terms apply to the Resident Medical Superintendent, W. W. HORTON, M.D.
Nat. Tel. 130.

SPRINGFIELD HOUSE

(Telephone No. 17) **Near BEDFORD**

A PRIVATE HOME for MENTAL CASES.

Ordinary terms Five Guineas per week (including Separate Bedrooms for all suitable cases without extra charge).

For forms of admission, &c., apply to the Drs. BOWER, as above, or at 5, Duchess-street, Portland-place, W. 1, on Tuesdays from 4 to 5.

KINGSDOWN HOUSE,

BOX, near BATH.

Telephone: No. 2 BOX.

For the care and treatment of Nervous and Mental Disorders in Both Sexes.

Separate accommodation for Voluntary Boarders of the Female sex

Applications should be addressed at the above or 17, Belmont, to
H. C. MACBRYAN, Medical Superintendent.

ST. ANDREW'S HOSPITAL

FOR MENTAL DISEASES,

NORTHAMPTON.

President—The Most Hon. the MARQUESS of EXETER, C.M.G., C.B.E.

This Registered Hospital receives for treatment PRIVATE PATIENTS of the UPPER and MIDDLE CLASSES of both Sexes. The Hospital, its branches (including a Seaside Home at Llanfairfechan, North Wales), and its numerous Villas are surrounded by over a thousand acres of Park and Farm.

Voluntary Boarders without certificates received.

For particulars, apply to DANIEL F. RAMBAUT, M.A., M.D., the Medical Superintendent. TELEPHONE No. 56.

Dr. Rambaut can be [illegible] by appointment on Wednesdays at 39, Harley Street, W.1. TELEPHONE: LANGHAM 1827.

EPILEPSY.

Colthurst House School,

Warford, Alderley Edge.

Under the Management of the Committee of the David Lewis Colony.

Home Life, Medical Care, School Education, most suitable for boys subject to Epilepsy.

Further particulars may be obtained from Dr. ALAN MCDOUGALL, The Colony, Warford, Alderley Edge.

EPILEPSY. THE DAVID LEWIS COLONY.

Stands in its own grounds of 180 acres and is situated in a beautiful part of Cheshire, 2½ miles from Alderley Edge Station, and 14 miles from Manchester. Electric light throughout. The Colony system ensures the social life and employment most suitable for those who suffer from Epilepsy. Patients certifiable under the Lunacy or Mental Defectives Acts are NOT ELIGIBLE for admission. Two Resident Physicians.

Terms according to accommodation and requirements. Private rooms can be provided.

For further information apply to the Director, Dr. ALAN MCDOUGALL, Warford, near Alderley Edge, Cheshire.

BISHOPSTONE HOUSE, BEDFORD

Telephone 708.

Private Home for Mentally Afflicted Ladies; ten only received.
Terms 6 gns. weekly.
Apply Medical Officer, or Mrs. Peele.

MALLING PLACE, KENT

For LADIES and GENTLEMEN of Unsound Mind,

Terms Moderate. Apply to Resident Medical Superintendent.
Telegrams: ADAM, WEST MALLING. Telephone: No. 2 MALLING.

CHEADLE ROYAL,

CHEADLE, CHESHIRE.

This Hospital for **MENTAL DISEASES** with its seaside branch Glan-y-Don, Colwyn Bay, is for the treatment of PRIVATE PATIENTS of the UPPER and MIDDLE CLASSES. Voluntary Boarders received.

For terms, &c., apply to the Superintendent, J. A. C. ROY, M.B., or he may be seen at 72, Bridge-street, Manchester, on Tuesdays and Fridays from 2 to 3. Telephone: No. 208 Cheadle Hulme.

HOME FOR FEEBLE-MINDED

BRUNTON HOUSE, LANCASTER.

This well-appointed private establishment overlooks Morecambe Bay and possesses extensive gardens and grounds, with tennis and croquet lawns. Varied scholastic and manual instruction. Individual attention given by experienced staff under Lady Matron. For terms apply Dr. W. H. Coupland, Medical Superintendent.

THE COPPICE, NOTTINGHAM.

HOSPITAL FOR MENTAL DISEASES.

President: The Right Hon. the EARL MANVERS.

This Institution is exclusively for the reception of a limited number of PRIVATE PATIENTS of both sexes, of the UPPER and MIDDLE CLASSES, at moderate rates of payment. It is beautifully situated in its own grounds, on an eminence a short distance from Nottingham, and commands an extensive view of the surrounding country; and from its singularly healthy position and comfortable arrangements affords every facility for the relief and cure of those mentally afflicted. For terms, &c., apply to the Medical Superintendent.

STRETTON HOUSE,

Church-Stretton, Shropshire.

A Private HOME for the treatment of Gentlemen suffering from Mental Diseases. Bracing hill country. See "Medical Directory," p. 2119. Apply to Medical Supt. Tel.: 10 P.O. Church-Stretton

LITTLETON HALL, BRENTWOOD, ESSEX

(18 MILES FROM LONDON.)

400 feet above sea.

HOME for few LADIES Mentally Afflicted. Large grounds. Liverpool-st. 26 min. Stations: Brentwood, Shenfield, one mile. Boarders received. Apply Dr. Haynes. Telephone and Telegrams: Haynes Brentwood 45.

LAVERSTOCK HOUSE, SALISBURY.

A Private Home for the Care and Treatment of sufferers from **Drug Habits, Mental or Nervous Disorders.** Ladies or Gentlemen can be received either as Certified Patients or Voluntary Boarders. Only moderate number of patients of the Upper and Middle Classes taken. Healthily situated in extensive and prettily laid-out games grounds and gardens. Special arrangements for mild cases or those requiring private apartments. Terms moderate.

For Illustrated Prospectus and terms apply to J. R. BENSON, Medical Superintendent. Telephone: Salisbury 12. Telegrams: Benson, Laverstock, Salisbury.

SHAFTESBURY HOUSE

Formby-by-the-Sea, LANCASHIRE.

For the CARE and TREATMENT of Ladies and Gentlemen MENTALLY AFFLICTED, with or without certificates. Consultations in Liverpool or Southport can be arranged by telephone.

For terms apply MEDICAL SUPERINTENDENT. Tel. No. [illegible] Formby.

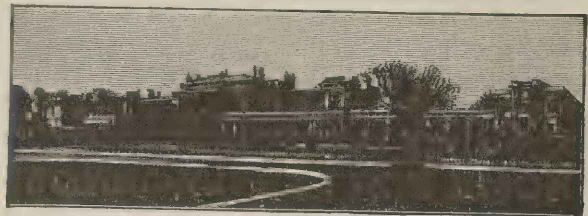
PECKHAM HOUSE

Established 1826

112, PECKHAM ROAD, LONDON, S.E.

Telegram: "Alleviated, London." **Telephone: New Cross 576.**

An Institution licensed for the CARE and TREATMENT of the MENTALLY AFFLICTED of Both Sexes. Conveniently situated. Electric trams and omnibuses from the Bridges and West-End pass the House. Private houses with electric light for suitable cases adjoining the Institution. Holiday parties sent to the Seaside branch at Worthing during the Summer months. Moderate terms.—Apply to Medical Superintendent for further particulars.



NORTHWOODS HOUSE

WINTERBOURNE, near BRISTOL.

FOR PRIVATE TREATMENT OF MENTAL DISEASES.

Situated in a large park in a healthy and picturesque locality, easily accessible by rail viâ Bristol, Winterbourne, Patchway, or Yate Stations. Uncertified Boarders received. For further information see Medical Directory, page 2131. Terms moderate.

Dr. J. D. Thomas and Dr. J. R. P. Phillips, O.B.E., Resident Physicians and Licensees.

HAYDOCK LODGE, Newton-le-Willows, LANCASHIRE.

A PRIVATE MENTAL HOSPITAL FOR THE CARE AND TREATMENT OF MENTAL AND NERVOUS CASES OF BOTH SEXES, EITHER VOLUNTARY OR UNDER CERTIFICATES, preference being given to Recoverable Cases.

Terms from **£2 2s.** per week upwards. Private Apartments on special terms.

Situated mid-way between Manchester and Liverpool. Two miles from Newton-le-Willows Station on the L. & N. W. Rly., and close to Ashton-in-Makerfield Station on the G.C. Rly. in direct communication with Manchester.

CONSULTING ROOMS (Dr. Street), 47, Rodney Street, Liverpool, from 2 to 4 P.M., or by appointment. Telephone: 2458 Royal Liverpool. Manchester (Dr. Mould), Winter's Buildings, St. Ann Street, on Tuesdays and Thursdays from 12 to 1.30 P.M., or by appointment.

VISITING AND CONSULTING PHYSICIANS—Sir JAMES BARR, LL.D., M.D., F.R.C.P., 72, Rodney Street, Liverpool; G. E. MOULD, Physician for Mental Diseases to the Sheffield Royal Hospital, The Grange, Rotherham.

For further particulars and forms of admission apply Resident Medical Proprietor, Haydock Lodge, Newton-le-Willows, Lancs.

Telegraphic Address: "STREET, Ashton-in-Makerfield." Telephone: 11 Ashton-in-Makerfield.

The OLD MANOR, SALISBURY.

Telephone 51.

A Private Hospital for the Care and Treatment of those of both sexes suffering from Mental Disorders.

Extensive grounds. Detached Villas. Chapel. Garden and dairy produce from own farm. Terms very moderate.

Illustrated Brochure on application to the Secretary.

CAMBERWELL HOUSE, 33, PECKHAM RD., LONDON, S.E. 5.

Telegrams: "PSYCHOLIA, LONDON." Telephone: New Cross 1057.

For the Treatment of Mental Disorders.

Completely detached Villas for Mild Cases. Voluntary Boarders received. 20 acres of grounds with extensive allotments on which gardening is encouraged. Cricket pitches, hard and soft Tennis Courts, croquet, squash rackets, and all indoor amusements, including Wireless and other Concerts. Daily Services in Chapel. Senior Physician: FRANCIS H. EDWARDS, M.D., M.R.C.P. An illustrated Prospectus, giving full particulars and terms, may be obtained on application to the Secretary.

HOVE VILLA, BRIGHTON.

A Convalescent Branch of the above, to which all suitable patients may be sent on holiday.

INEBRIETY.

(Telephone: 16 Rickmansworth.

DALRYMPLE HOUSE, RICKMANSWORTH, HERTS.

For the treatment of Gentlemen under the Act and privately. Established 1883 by an association of prominent medical men and others for the study of inebriety; profits, if any, are expended on the institution. Large secluded grounds on the banks of the river Colne. All kinds of out-door and in-door recreations and pursuits.—For particulars apply to F. S. D. HOGG, M.R.C.S., &c., Resident Medical Superintendent.

THE DEESIDE SANATORIA IN SCOTLAND

FOR THE OPEN-AIR TREATMENT OF

PULMONARY TUBERCULOSIS and ALLIED DISEASES

At BANCHORY and MURTLE.

Medical Director - - DAVID LAWSON, M.A., M.D., F.R.S.E.

These Sanatoria are situated amidst **Ideal Surroundings in Middle Deeside**, the reputation of whose **Climate** in the treatment of Lung Diseases is well established.

Both Institutions are well equipped with **Research Laboratory, Throat Room, Dental facilities**, and powerful **X-Ray Plant. Full Day and Night Nursing Staffs** are employed.

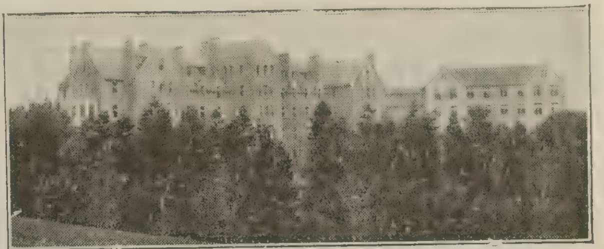
Special Treatment by artificial **Pneumothorax** (with X-ray Control), the various **Tuberculins**, and Autogenous **Vaccines**, &c., is available without extra charge.

NORDRACH-ON-DEE

At BANCHORY, near BALMORAL.

Physician - - - - DR. IAN STRUTHERS STEWART.
Assistant Physician - DR. J. C. LORRAINE.

For particulars apply Secretary.



TOR-NA-DEE SANATORIUM

At MURTLE, ABERDEENSHIRE.

Senior Physician - - DR. J. M. JOHNSTON.
Assistant Physicians - DR. JAMES LAWSON & DR. A. C. FOWLER.

Inclusive terms 7 guineas a week.

For further particulars apply Secretary.

The Scottish Branch of the British Red Cross Society is prepared to contribute towards payment of the fees of ex-Officers and Nurses recommended by the Society, and such Officers and Nurses obtain priority of admission to TOR-NA-DEE.

YARROW CONVALESCENT HOME, BROADSTAIRS.

FOR CHILDREN OF WELL-EDUCATED PEOPLE OF VERY LIMITED MEANS.

CHARGE, 10s. PER WEEK FOR EACH CHILD.

This fee is subject to addition or deduction according to Parents' means.

100 Beds. Boys, ages 4 to 12. Girls, ages 4 to 14.

The usual stay is 4 weeks, but some wards are reserved for serious cases requiring special treatment, and for these a lengthened stay may, under some circumstances, be granted, and the age limit raised to 14 for Boys and 16 for Girls.

The Home faces the sea, and is open all the year, being as well adapted for winter, as for summer residence.

Particulars can be obtained from the Secretary, YARROW CONVALESCENT HOME, 116, Victoria St., Westminster, London, S.W.1.

The work hitherto carried on at

DUFF HOUSE, BANFF, SCOTLAND,

has been transferred to

RUTHIN CASTLE, NORTH WALES,

which is now opened as a Private Hospital for sufferers from any non-infectious INTERNAL DISEASES who need investigation or treatment.

Special arrangements are made for carrying out the preliminary tests needed for the proper administration of INSULIN in diabetes.

Application should be made to the Secretary.

MUNDESLEY SANATORIUM

Specially built for the treatment of Pulmonary and other forms of Tuberculosis. Aspect S.S.W., on a carefully chosen site. Pure, bracing air. High sunshine record. Heliotherapy. One mile from the coast. Electric light throughout. X-Ray installation. Full day and night Nursing Staff.

Resident Physicians:

S. VERE PEARSON, M.D.(Camb.), M.R.C.P.(Lond.).
GEOFFREY LUCAS, B.A.(Camb.), M.D.(Durham).
L. WHITTAKER SHARP, M.B.(Camb.).

Apply Secretary, Sanatorium, Mundesley, Norfolk.

MENDIP HILLS SANATORIUM

FOR THE OPEN-AIR TREATMENT OF PULMONARY TUBERCULOSIS

Old-established, beautifully situated, 300 acres of Sanatorium grounds. Pinewoods and sheltered avenues. Altitude 850 feet. Extensive views. Separate chalets, with verandahs; hot-water radiators, and electric light in every room and chalet. Graduated Exercises. Inhalation. Electric treatment, &c. Individual attention. *Resident Physician*—Dr. C. MUTHU.

For particulars apply SECRETARY, Hillgrove, Wells, Somerset.

VALE OF CLWYD SANATORIUM.

This Sanatorium is established for the treatment of Tuberculosis of the Lungs and of the Pleural Cavities. It is situated in the midst of a large area of park-land at a height of 450 feet above sea-level, on the south-west slopes of mountains rising to over 1800 feet, which protect it from the north and east winds and provide many miles of graduated walks with magnificent views.

Trained Nursing Staff day and night. X-Ray apparatus. Treatment by Artificial Pneumothorax in suitable cases.

Electric lighting in every room. Heating by radiators. For particulars apply to Medical Superintendent,
H. MORRISTON DAVIES, M.D., M.Ch. (Cantab.), F.R.C.S., Llanbedr Hall, Ruthin, N. Wales.

HOSPITAL FOR CONSUMPTION

AND DISEASES OF THE CHEST,
BROMPTON,
and FRIMLEY SANATORIUM.

SPECIAL WARDS FOR PAYING PATIENTS.
3 guineas per week.
Apply to the Secretary, Brompton Hospital, S.W. 3.

DARTMOOR SANATORIUM. 750 FEET.

WITHIN EASY REACH OF THE MOOR.
X-RAY APPARATUS RECENTLY INSTALLED.
Resident Physicians—C. H. BERRY, M.R.C.S., L.R.C.P.; E. A. CRICHLOW, M.R.C.S., L.R.C.P.
For particulars, apply C. H. BERRY, M.R.C.S., Sanatorium, Chagford, Devonshire. Telephone: 11 Chagford.

DROITWICH BRINE BATHS WARNING.

The Public are warned that the full benefits of the treatment for Rheumatism and kindred complaints **CAN ONLY BE OBTAINED IN THE NATURAL BRINE BATHS AT DROITWICH, FOR WHICH THERE IS NO SUBSTITUTE.** LOVELY HOLIDAY DISTRICT. GOOD HOTELS, &c. Illustrated Booklet Post-free from Baths Manager, J. H. HOLLYER, 48, Spa Enquiry Offices, Droitwich (Worcs.). **SPECIAL FACILITIES TO MEDICAL MEN.**

SMEDLEY'S HYDRO.

MATLOCK. Established 1853.

Physicians: G. C. R. Harbinson, M.B., B.Ch.
R. MacLelland, M.D., C.M. (Edin.).

Prospectus and full information on application to the Managing Director.

PALACE SANATORIUM,

MONTANA-SUR-SIERRE,

SWITZERLAND.

TUBERCULOSIS CURE STATION

(All the Year). THE FINEST IN EUROPE.

5000 ft. high. Accommodation for 100 patients.

Principal Resident Medical Officer:
BERNARD HUDSON, M.D.Cantab., M.R.C.P.,
Late Physician to the Queen Alexandra Sanatorium,
Davos Platz.

FULL PARTICULARS FROM THE SECRETARY, 5, ENDSLEIGH GARDENS, LONDON, N.W.1.

Telegraphic Address: "Relief, Old Catton."
Telephone: "290 Norwich."

NERVOUS & MENTAL AFFECTIONS.

Ladies only received.

The Grove, Old Catton, Norwich.—**A High-class Home** for the **Curative Treatment** of Nervous Affections. **Voluntary Boarders** are also received without certificates.

For full particulars apply to the Misses MCLINTOCK, or to Dr. S. BARTON, 34, Surrey-st., Norwich, Visiting Physician.

St. Michael's, Broadstairs.—A charming Country HOUSE, beautiful garden, South aspect, close to sea, where Invalids are received for Rest, Care, or Convalescence. Accommodation for Spinal Cases. Excellent cooking. Moderate charges.—Apply, Miss Gertrude Fletcher, R.R.C.

Doctor can receive Patient or Guest in his charming Residence. Good staff of Nurses and Servants.—Dr. Meyrick, 48, Ennismore-gardens, S.W. 7. Telephone: 2130 Kensington.

Neurasthenic, Rest Cure, and Chronic CASES are received from 5 guineas weekly in Doctor's Country Home. Golf, tennis, &c. Own poultry, fruit and vegetables. Tel. 194 Chertsey.

Apply, Dr. Alexander, Harcourts, Chertsey.

Grove House, All Stretton, Church STRETTON, SHROPSHIRE.

A PRIVATE HOME for the Care and Treatment of a limited number of Ladies Mentally Afflicted.

Climate healthy and bracing.

Apply to Dr. McClintock, Proprietor and Resident Medical Superintendent.

Bucks Mental Hospital, Stone, near Aylesbury.

The Visiting Committee of this Hospital can receive PRIVATE PATIENTS at a minimum weekly Charge of 1½ guineas. Apply to the Medical Superintendent.

Backward, undeveloped young GentleMEN received (Approved Home). Happy, healthy surroundings. Highly recommended.—Mr. and Mrs. Loveless, Lynwood, Woburn Sands, near Bletchley, Bucks.

Guests received at Country House in own grounds (9 acres pasture and woodland). Fine air, charming scenery, tennis, boating.—Old Rectory, Wheatacre, Beccles, Suffolk.

South Coast.—Lady with house in healthy position near Bournemouth would undertake Care of Children, with or without nurses, while parents abroad, or would look after invalids or delicate children. Highest references.—Apply, "Fairfield," Studland.

Royal Free Hospital, Gray's Inn-road, W.C. 1.—Applications are invited from fully qualified registered Medical Men or Women for the post of CASUALTY OFFICER. Salary £100 per annum, with board and residence.

Applications, stating age, accompanied by copies of three recent testimonials, should be addressed to the undersigned on or before the 6th October, 1923.

REGINALD R. GARRATT, Secretary.

Paddington Green Children's Hospital, London, W. 2. — HOUSE PHYSICIAN, HOUSE SURGEON. These appointments will become vacant on November 1st, 1923. Gentlemen are invited to send in their applications, with copies of three testimonials, addressed to the undersigned not later than October 11th, 1923. Salary of each £150 per annum, with board and residence. Candidates who have held a responsible Resident Hospital appointment are preferred. The appointments are for a period of six months.

JAMES A. HAMLIN, Secretary.

Western Ophthalmic Hospital, Marylebone-road, N.W. 1.—Applications are invited for the posts of SENIOR and JUNIOR NON-RESIDENT HOUSE SURGEONS. The salaries are at the rate of £150 and £100 per annum respectively and the appointments are for six months. The selected candidates will be required to take up duty early in October. The present holder of the junior office is a candidate for the senior, and candidates for the latter post should indicate whether they are prepared to accept the junior position.

Applications, accompanied by copies of three recent testimonials, should reach me by October 1st.

H. W. BURLEIGH, Honorary Secretary.

London Lock Hospital, 91, Dean-street, London, W. 1.—The Board of Management invite applications for the post of HOUSE SURGEON at the Male Lock Hospital. Candidates must be doubly qualified and duly registered. Salary at the rate of £200 per annum, with furnished flat, full board, and laundry.

The appointment to be for six months, duties to commence on or about 17th October 1923.

Applications, enclosing copies (only) of three recent testimonials to be sent to the undersigned at the Male Lock Hospital, 91, Dean-street, W. 1, on or before 10 A.M. Tuesday, 9th October, 1923.

By order of the Board.
HY. EASON, Secretary.

South London Hospital for Women,

South Side, Clapham Common, S.W. 4.

APPOINTMENT OF TEMPORARY ASSISTANT PHYSICIAN.

The Board of Management invite applications from fully qualified Medical Women for the post of Temporary Assistant Physician to attend at the Out-patient Dept., Newington Causeway, S.E., on Tuesday and Friday afternoons.

The appointment to be for a period of twelve months. Full particulars may be obtained from the Secretary. Applications with copies of testimonials to reach the Secretary at the Hospital not later than the first post on Thursday, October 4th, 1923.

King's College Hospital.

Applications are invited before Wednesday, October 10th, 1923, for the following appointments:—

CLINICAL ASSISTANTS in the Medical, Surgical, Gynæcological, Children's Neurological, Cardiological, Aural, Laryngological, Ophthalmic, Skin, Urological, Orthopædic, Pathological, and Radiological, Departments.

MEDICAL and SURGICAL OUT-PATIENT OFFICERS.

SAMBROOKE MEDICAL, SURGICAL and OBSTETRIC REGISTRARS.

Particulars of the above may be obtained from the House Governor, King's College Hospital, Denmark Hill, S.E. 5.

Italian Hospital, Queen Square, W.C. 1.—The Committee of Management invite applications for the post of ASSISTANT ANÆSTHETIST from fully qualified candidates.

Applications with testimonials (copy only), should be sent to the Secretary on or before October 13th.

Resident Medical Officer.—The Committee of Management of the HOSPITAL FOR CONSUMPTION AND DISEASES OF THE CHEST, Brompton, invite applications for the post of Resident Medical Officer. Salary £500 per annum, with board and residence.

Applications, with testimonials, to be sent in on or before Thursday, October 18th, 1923. Candidates must be registered Practitioners and qualified in Medicine and Surgery, single, and not under twenty-five years of age. Printed instructions with particulars of the duties may be had on application to the Secretary at the Hospital. FREDERICK WOOD, Secretary.

Brompton, September, 1923.

Hospital for Consumption and DISEASES OF THE CHEST, Brompton, S.W.—The Committee of Management invite applications for the post of HOUSE PHYSICIAN (for which there are two vacancies). The duties include work in the Out-patient Department as well as in the wards. Further particulars may be obtained from the undersigned, to whom applications, with testimonials, should be addressed not later than 20th October, 1923. Candidates will be required to attend the meeting of the Medical Committee on Wednesday, October 24th, at 4.30 P.M. The appointment is for six months, with an honorarium of £50.

September, 1923. FREDERICK WOOD, Secretary.

Central London Throat, Nose and Ear

HOSPITAL, Gray's Inn-road, W.C. 1.

REGISTRARS.

There are vacancies for Three Registrars. The office is honorary and tenable for one year, subject to re-election. Attendance required on two afternoons a week. The duties are to assist the Surgeons in their attendance upon patients, and to keep the records. Applications should be sent to the undersigned immediately. RICHARD KERSHAW, Secretary.

The Prince of Wales's General HOSPITAL, Tottenham, N. 15.—Applications are invited for the following posts, vacant on the 15th October next :—

HOUSE SURGEON. £150 per annum.
HOUSE PHYSICIAN. £150 per annum.
JUNIOR HOUSE SURGEON. £110 per annum.
JUNIOR HOUSE PHYSICIAN. £110 per annum.

With residence, board, and laundry.

The appointments are held for six months, but the holders are eligible for re-appointment for a further term.

Candidates (Male) must be duly qualified and registered, and applications, together with copies of three recent testimonials, to be sent to me on or before Monday, 1st October next.

September 6th, 1923. FREDK. W. DREWETT, Director.

The Hospital for Sick Children,

Great Ormond-street, London, W.C. 1.

A HOUSE PHYSICIAN and ASSISTANT CASUALTY OFFICER is required on the 14th October, 1923.

Gentlemen are invited to send in their applications, addressed to the Secretary before 12 o'clock on Monday, 8th October, 1923, with copies of not more than three testimonials given specially for the purpose, and also evidence of their having held a responsible Hospital appointment.

The appointment is made for six months. Salary £50, laundry allowance £2 10s., and board and residence in the Hospital.

Candidates must be unmarried and possess a legal qualification to practise.

They will be required to attend before the Joint Committee at their meeting on Wednesday, the 10th October, 1923, at 5 P.M. precisely.

Forms of application to be obtained from the Secretary.

By order of the Board of Management.

August 1923. JAMES MCKAY, Secretary.

The Hospital for Sick Children,

Great Ormond-street, London, W.C. 1.

A HOUSE SURGEON is required on the 12th October, 1923.

Gentlemen are invited to send in their applications, addressed to the Secretary, before 12 o'clock on Monday, 8th October, 1923, with copies of not more than three testimonials, given specially for the purpose, and also evidence of their having held a responsible Hospital appointment.

The appointment is made for six months. Salary £50, laundry allowance £2 10s., and board and residence in the Hospital.

Candidates must be unmarried and possess a legal qualification to practise.

They will be required to attend before the Joint Committee at their meeting on Wednesday, 10th October, 1923, at 5 P.M. precisely.

Forms of application to be obtained from the Secretary.

By order of the Board of Management.

September, 1923. JAMES MCKAY, Secretary.

The Middlesex Hospital, W.1.

Applications are invited for the post of RADIUM OFFICER to the Hospital. Hours 9–5. Salary £300. Applicants should be registered Medical Practitioners, and applications should be presented not later than noon on Tuesday, the 16th October. By order of the Board.

WALTER KEWLEY, Secretary-Superintendent.

21st September, 1923.

Royal Eye Hospital, St. George's-circus, Southwark, S.E. 1.—Wanted, JUNIOR HOUSE SURGEON, resident. Honorarium at the rate of £75 per annum. Applications to Secretary.

There are vacancies in the Out-patient Department for CLINICAL ASSISTANTS with Ophthalmic experience.

Royal Eye Hospital, St. George's-circus, Southwark, S.E.—Applications are invited for the post of HONORARY ASSISTANT SURGEON.

Particulars from the Secretary.

There are also vacancies for unsalaried CLINICAL ASSISTANTS.

The Hospital contains 42 beds and 2 cots. The In-patients exceed 900 and the new out-patients exceed 21,000 per annum.

Hull City Asylum.—Junior Assistant MEDICAL OFFICER (preferably a Lady) required. Salary £300 per annum, with board and residence. Appointment subject to provisions of Asylum Officers' Superannuation Act. Applications, with copies of not more than three recent testimonials, to be forwarded before the 12th October to the Medical Superintendent, Hull City Asylum, Willerby, near Hull.

Derbyshire Royal Infirmary, Derby.

(General Hospital—320 Beds.)

Applications are invited for the following Resident Appointments :—

TWO HOUSE SURGEONS.
HOUSE PHYSICIAN.
OPHTHALMIC HOUSE SURGEON.
ASSISTANT HOUSE SURGEON AND CASUALTY OFFICER.

The appointments are tenable for six months from 1st November, with a possibility of extension for a further period of six months. Salary £200 per annum, with apartments, board, &c.

Applications, with copies of not more than five testimonials, to be sent to the undersigned not later than 12th October.

WALTER BANKS, Superintendent and Secretary.

24th September, 1923.

Norfolk and Norwich Hospital,

Norwich.

APPOINTMENT OF HONORARY SURGEON.

The Board of Management, in compliance with Law 42, hereby gives notice that there is a vacancy for an Honorary Surgeon, which will be filled on Saturday, 3rd November, 1923, at 12.30 P.M.

Candidates for the office of Surgeon shall produce evidence of being Masters or Bachelors of Surgery of one of the Universities of the British Empire, or of being Fellows of one of the Royal Colleges of Surgeons of the British Empire, and of being registered according to the provisions of the Medical Act.

Applications, with copies of testimonials, must be sent not less than fourteen days before the day of election to the undersigned, from whom further particulars regarding the post may be obtained. By order,

28th September, 1923. FRANK INCH, Secretary.

County Borough of Croydon.

PUBLIC HEALTH DEPARTMENT.

CROYDON BOROUGH SANATORIUM, NORTH CHEAM.

APPOINTMENT OF RESIDENT MEDICAL SUPERINTENDENT.

NOTICE IS HEREBY GIVEN that the Council are prepared to receive applications for the appointment of Resident Medical Superintendent at the Croydon Borough Sanatorium, situate at North Cheam, near Sutton, Surrey.

Applicants must be registered Medical Practitioners and special experience in the diagnosis and treatment of Tuberculosis is essential. Preference will be given to candidates who have held previous appointments in Sanatoria and in General Hospitals.

The salary will be £750 per annum, with a deduction for emoluments.

Further particulars, with a list of duties and form of application, can be obtained at my office upon receipt of a stamped addressed foolscap envelope.

Applications must be sent to me, with copies (not originals) of not more than three testimonials of recent date not later than 11 o'clock in the forenoon of Monday, the 15th day of October, 1923, and endorsed "Resident Medical Superintendent, Croydon Borough Sanatorium."

Canvassing in any form is prohibited.

JOHN M. NEWNHAM, Town Clerk.

Town Hall, Croydon, 25th September, 1923.

North Riding Mental Hospital, York.— Wanted, Temporary ASSISTANT MEDICAL OFFICER Seven guineas weekly, with board, lodging, &c. Apply, Medical Superintendent.

Leeds Public Dispensary.—Wanted, JUNIOR RESIDENT MEDICAL OFFICER. Salary £150 per annum with board, residence, and laundry. Separate sitting-room. Applications, with copies of three recent testimonials, to be addressed to the Secretary of the Faculty, Public Dispensary, North-street, Leeds.

The Bristol Royal Infirmary.— Applications are invited for the post of HONORARY DENTAL SURGEON. Candidates who must have a registered Surgical qualification and a registered qualification in Dental Surgery, to send in their applications, stating age, together with copies of not more than three testimonials, to the undersigned on or before October 16th, 1923.

ELLIS C. SMITH, F.C.I.S., Secretary.

Royal Surrey County Hospital,

Guildford. 110 Beds.

Wanted HOUSE SURGEON (Male). Salary £150, with board, residence, and laundry.

Applications, stating essential particulars, with copies of testimonials to the Secretary.

Clare Hall Hospital and Sanatorium (FOR TUBERCULOSIS).—An ASSISTANT MEDICAL OFFICER (Male) is required at the above Hospital. Salary £350, with board, lodging, and washing.

Applications, with testimonials, and stating when disengaged, to be made to The Medical Superintendent, Clare Hall, South Mimms, Barnet.

Shropshire Orthopædic Hospital,

Oswestry. (350 Beds.)

Applications are invited for the post of RESIDENT SURGICAL OFFICER. Salary £500 per annum, with quarters, &c.

Appointment for one year with possibility of re-election.

Applications, stating experience in General and Orthopædic Surgery, enclosing copies of testimonials, should be sent to the Secretary not later than October 18th.

Shropshire Orthopædic Hospital,

Oswestry. (350 Beds.)

TWO HOUSE SURGEONS.

Applications are invited for the post of House Surgeon, with board, washing, and quarters. Salary £250 per annum. Appointment for one year, renewable on the recommendation of the Medical Board.

Applications, with copies of testimonials, should be sent to the Secretary not later than October 18th.

Mount Vernon Hospital for Diseases

OF THE CHEST, Northwood, Middlesex.

There is a vacancy for an ASSISTANT PHYSICIAN. The Committee of Management are prepared to receive applications for the post of Assistant Physician. Candidates must be graduates in medicine of a University of the United Kingdom and Fellows or Members of the Royal College of Physicians of London. Applications, with copies (not originals) of testimonials should be sent to the Secretary at the Office and Outpatient Department, 7, Fitzroy-square, W. 1.

WM. J. MORTON, Secretary.

Croydon General Hospital.—Wanted, JUNIOR HOUSE SURGEON (Male). Salary £150 per annum, with residence, board, and laundry. Candidates must hold registered qualifications in Medicine and Surgery. The appointment will be terminated by one month's notice. Applications, stating age and the earliest date upon which duties could be commenced, accompanied by copies (which will not be returned) of recent testimonials, to be sent to the undersigned, from whom further particulars may be obtained if desired.

GEORGE H. DAMS, Secretary.

Croydon, 24th September, 1923.

Staffordshire General Infirmary, Stafford.—HOUSE PHYSICIAN wanted, to take up duties on the 2nd November. Candidates must possess a Diploma from the College of Surgeons in London, Edinburgh or Dublin, or a degree of Surgery from one of the Universities, and a qualification in Medicine which shall entitle to register.

Salary £150 per annum, with board, lodgings, &c.

Applications, stating age qualifications, and experience, accompanied by three recent testimonials, to be sent to the undersigned not later than first post Tuesday, the 2nd October

A. E. COLLINS, Secretary.

Stafford, 18th September, 1923.

Wanted, Duff House Private Hospital, Ruthin Castle, North Wales, RESIDENT ASSISTANT PHYSICIAN, unmarried. Salary £300, with board and lodging.

Apply, giving clinical and laboratory experience in detail, with references, to the Secretary, Ruthin Castle, North Wales.

West Bromwich and District

HOSPITAL. (105 Beds.)

Wanted, a RESIDENT ASSISTANT HOUSE SURGEON (Male). He must be doubly qualified and unmarried. Salary £180 per annum, with board, residence, and washing.

Applications, stating age, and if possessing a knowledge of Ophthalmic Surgery, and accompanied by copies of testimonials, should be sent to me on or before September 20th.

By order.

FRANK I. HANCOCK, Secretary and Superintendent.

City and County of Newcastle-upon-

TYNE.

CITY HOSPITAL FOR INFECTIOUS DISEASES.

RESIDENT MEDICAL ASSISTANT (MALE).

Wanted immediately, a Male Resident Medical Assistant (unmarried), who holds a registrable qualification in Medicine and Surgery, and preferably also in Public Health, and possesses a practical knowledge of Bacteriology.

The officer appointed will be engaged for one year, subject to re-appointment. Salary £350 per annum, with board, lodging, &c. Applications, stating age, qualifications, and previous experience, with copies of not more than three recent testimonials, to be forwarded to the Medical Officer of Health, Town Hall, Newcastle-upon-Tyne.

17th September, 1923.

City and County of Kingston-

UPON-HULL.

RESIDENT MEDICAL OFFICER.

The Corporation of Hull invite applications for the appointment of a Male Resident Medical Officer (single) to take charge of their Infectious Diseases Hospitals. Salary £400 per annum, plus Civil Service scale of bonus, with board and residence.

Applicants must have had practical experience in the treatment of cases of Infectious Disease.

The successful candidate will reside at the City Hospital, and will be required to devote the whole of his time to the management and working of this Institution, the Evan Fraser Hospital, and the performance of such other duties as may be required of him. Whilst entirely responsible for the treatment of patients under his care, he will for all administrative purposes be under the Medical Officer of Health.

Applications, on forms to be obtained from the undersigned, with copies of not more than three recent testimonials, and endorsed "Resident Medical Officer," should be forwarded to me not later than the 15th October, 1923.

J. WRIGHT MASON, Medical Officer of Health.

Guildhall, Hull, 13th September, 1923.

Leeds Maternity Hospital (75 Beds). SECRETARY required, for accounts, correspondence, purchases, &c. Hospital experience preferred. Applications in writing only, stating salary required and giving full particulars to the Hon. Secretary, Mrs. Austyn Barran, The Elms, Chapel Allerton, Leeds.

Egyptian Government School of

MEDICINE.

Applications for the post of LECTURER in EXPERIMENTAL PHYSIOLOGY are invited from qualified Egyptians.

Applicants should have had experience in teaching the subject or should have done research in it.

Salary L.E.540 a year. Contract for one year.

Applications, accompanied by testimonials and full record of experience, should be sent to The Director, Egyptian Educational Mission, 28, Victoria-street, S.W. 1, not later than October 14th, 1923.

Wanted by large Company for their Eastern Staff, two unmarried MEDICAL OFFICERS, ages not exceeding thirty-five years. Liberal terms will be offered to suitable candidates. Full particulars of school and college training and Hospital and other experience, together with professional references, should in the first instance be sent to Box 204, Shaw & Blake, Ltd., Advertising Agents, 8, Bell Yard, Temple Bar, W.C. 2.

Assistant, with view to Early Partnership, required in Provincial Town fifty miles from London. Must be exceptionally well qualified and of good address. Mixed practice.—Address, No. 210, THE LANCET Office, 423, Strand, W.C. 2.

Wanted immediately, First-class Histological Technician, experienced in neurological work.—Address, No. 215, THE LANCET Office, 423, Strand, W.C.2.

Locum Tenens Provided

at short notice.

Apply to Mr. PERCIVAL TURNER,

the oldest and only Agent for forty years, *without agency fee to Principals*, has supplied Practitioners with reliable substitutes.

4 & 5, ADAM STREET, ADELPHI, STRAND, W.C. 2.

Telegrams: Epsomian, London. Telephone: Gerrard 399.
After 5 P.M.—Tel. Epsom 695.

Locum Tenens Provided.

Apply to

Mr. W. S. ATKINS

(Late of Arnold & Sons, London),

43, Bedford-street, Strand, W.C. 2.

Telegraphic Address: "Positions, Westrand, London."
Telephone: Regent 229.

M.D. Lond., with wide experience practice, holding permanent appointment in London, Desires Evening Work. Would take charge of branch or lock-up surgery, either temporarily, permanently, upon salaried or partnership terms, preferably London N.W., N., or N.-E. Free after 5 o'clock.—Address, No. 216, THE LANCET Office, 423, Strand, W.C.2.

B.A. (Camb.), M.B., Ch.B. (Glas.), unmarried, experienced, desires ASSISTANTSHIP in or near London. Would accept small remuneration if allowed time off to attend post-graduate classes. With or without possibility of partnership later. Highest testimonials. Free now. Interview.—Address, No. 212, THE LANCET Office, 423, Strand, W.C.2.

M.B. (Lond.) would undertake Two Evening General Clinics a week in London during October, November, and December. References supplied on application.—Address, No. 193, THE LANCET Office, 423, Strand, W.C. 2.

M.D., with great experience of Practice, five years' war service, would like to Assist busy Doctor in London during daytime.—Address, No. 203, THE LANCET Office, 423, Strand, W.C. 2.

Gentleman gives Lessons on his two private Cars; also evenings and Sundays. Excellent testimonials. Terms very moderate.—Ring 4288 Mayfair. Capt. Nash, 16A, Allsop-place, Baker-street Station.

Wanted, London Representative for Surgical and Dental Needles. Connection essential.—Applications, in strictest confidence, to No. 191, THE LANCET Office, 423, Strand, W.C. 2.

Medical Men, possessing their own Bacteriological and Pathological Laboratories, can obtain trained, efficient, and experienced Women Laboratory Assistants who are also legally qualified Dispensers. Preparation for Examinations.—Apply, London College of Pharmacy, 7, Westbourne Park-road, W.2.

Liverpool District.—Advertiser, Accountant, undertakes secretarial work, writing up books, &c. Terms per day or week. Moderate.—Address, 5, Beechtree-road, Wavertree, Liverpool.

Educated Lady wishes post as SECRETARY to Physician or Surgeon. Capable stenographer correspondent, thorough knowledge medical terms. Own machine.—Address, No. 209, THE LANCET Office, 423, Strand, W.C. 2.

Dispenser, Lady, requires post with Doctor. Good experience. Age twenty-three.—W., "Tresco," The Uplands, Loughton, Essex.

Doctor getting married wishes to recommend his LADY HOUSEKEEPER; good cook, organiser, good knowledge of Medical work and the running of a doctor's household. Bright and active. Nine years' references. Age forty years.—Address, No. 217, THE LANCET Office, 423, Strand, W.C.2.

Wanted by young Lady, 27, Resident SECRETARYSHIP to Consultant or General Practitioner or Hospital appointment. Shorthand typist. Public Health Office experience.—Apply, C., c/o J. M. Moore & Armstrongs, Solicitors, South Shields.

Physician retiring desires to meet Successor. Small, good-class clientele, prescribing. London, S.W. Leading thoroughfare. Consulting-room and services provided. About £300 required and applicants must be of good social and professional standing.—Address, Physician, Messrs. Willing, Ltd., 33, Knightsbridge, London.

Wanted, a Practice or Partnership in South of England in Country or Country Town of £1500 to £2000 a year, by experienced man with ample means. Can purchase house if necessary.—Apply, No. 2712, c/o Mr. Percival Turner, 4, Adam-street, London, W.C.2.

Wanted, Practice or Partnership. Income from £800 (with scope) to £2000 a year. Town or Country. Purchaser can negotiate at once and has ample capital.—Apply, Peacock & Hadley, 19, Craven-street, Strand, W.C. 2. (No charge unless sale effected.)

Required at once, Practices and PARTNERSHIPS.—Mr. W. S. Atkins (late of Arnold & Sons, London) has a large number of Clients who are seeking Practices and Partnerships, and wish to settle down at once.—Send full particulars, in confidence, to Mr. W. S. Atkins, Medical Transfer Agency, 43, Bedford-street, Strand, London, W.C. 2.

Wanted, Practice in Healthy District with Panel in South or South-western Counties or Seaside, with as little opposition as possible. Receipts about £1000 per annum. Ample means.—Address, No. 213, THE LANCET Office, 423, Strand, W.C. 2.

Wanted, Country or Country Town PRACTICE producing over £1000 per annum. Panel not objected to. Good house and garden essential.—Send full details in confidence to Mr. W. S. Atkins, Medical Transfer Agency, 43, Bedford-street, Strand, W.C. 2.

Wanted, Country Practice, un-opposed preferred, producing about £2000–£2500 a year. Panel not objected to. Good house and garden. Replies treated as strictly confidential.—Apply, No. 2791, Mr. Percival Turner, 4, Adam-street, Strand, W.C.2.

Required in London or Suburbs, General PRACTICE with panel, producing over £1000 per annum. Send full details in confidence to Mr. W. S. Atkins, Medical Transfer Agency, 43, Bedford-street, Strand, W.C. 2.

London Suburb.— £2000 a year.— PARTNER wanted with early succession. Panel over 1300. House available to rent. Half Share for sale. Premium only 1½ years' purchase. Personally known.—Apply, No. 7407, Mr. Percival Turner, 4, Adam-street, Strand, W.C. 2.

Wanted, a Partnership by M.B., B.Ch., ex-Captain, R.A.M.C. Thoroughly experienced in Private and Panel. Ample means.—Address, No. 214, THE LANCET Office, 423, Strand, W.C.2.

Partnership.—Seaside Resort, North-west Coast.—Old established. Small panel. Good fees. Guaranteed share £800 a year net to begin with.—Apply, No. 7350, Mr. Percival Turner, 4, Adam-street, Strand, W.C. 2.

Eastern County.—Partnership £1600 a year.—Old-established Country Practice. Opposition slight. Panel over 900. Small house; rent £50. Half Share for £1050.—Apply, No. 7410, Mr. Percival Turner, 4, Adam-street, Strand, W.C. 2.

London, S.E.—A Partner required for a General Practice situated in a thickly populated district. Receipts £2000. Panel 1300. Fees 3s. 6d. upwards. Excellent house available containing four bedrooms, &c. Premium for Half Share £1500. View to succession. Premium for house £800, or near reasonable offer.—Apply, quoting Folio 842, Mr. W. S. Atkins, Medical Transfer Agency, 43, Bedford-street, Strand, W.C. 2.

South Coast.—£2800 a year.— PARTNERSHIP in an Old-established Practice in favourite seaside resort. Largely non-dispensing. Panel 1700. Fees 5s. upwards. A Third Share for disposal immediately—larger share later. Personally known and recommended.—Apply, No. 7412, Mr. Percival Turner, 4, Adam-street, Strand, W.C.2.

Partnership.—Over £5000 a year.— Good Residential Suburb. Very old established. One-fifth Share for disposal. House available on lease. A Graduate preferred over thirty. Panel over 2500. Preliminary Assistancy if desired.—Apply, No. 7381, Mr. Percival Turner, 4, Adam-street, Strand, W.C. 2.

Partnership.—Half Share for sale in Practice N.E. England. Average receipts 1920–1922 over £4500. No panel. Hospital. Good qualifications and experience in general hospital as H.S. or H.P. necessary.—Address, No. 205, THE LANCET Office, 423, Strand, W.C. 2.

For Disposal.—A really good Practice is not always to be had directly, but Mr. PERCIVAL TURNER (with forty years' personal experience) can generally offer applicants something suitable on being furnished with details of their requirements. Nearly all the best Practices are sold by him without being advertised.—Full information free of charge on application, personally or by letter, to 4, Adam-street, Adelphi, Strand, W.C. 2.

Midlands. — A General Practice situated in a Manufacturing centre. Receipts over £3500. Panel nearly 6000. Large house in good condition. Premium for House and Practice £6000.—Apply, quoting Folio 621, Mr. W. S. Atkins, Medical Transfer Agency, 43, Bedford-street, Strand, W.C. 2.

South Wales.—£1200 a year.—Easily worked; nearly all contract work. Great scope. Small house (up to date) and garden; rent £60.—Apply, No. 7391, Mr. Percival Turner, 4, Adam-street, Strand, W.C. 2.

London, W.—Owing to death of one of the partners an old-established good-class PRACTICE with Branch Surgery is for sale. Receipts have been about £1700 a year. Purchaser can choose his own residence. Introduction by remaining partner. Premium £1200.—Apply, Peacock & Hadley, 19, Craven-street, Strand, W.C. 2.

Welsh Coast.—Over £1500 a year.— Unopposed. Old established. Fees 3s. 6d. to 10s. 6d. Not much Midwifery. Panel over 1400. Other appointments about £130. Good house, four bed, bath, &c.; room for extension; garage. Price about one and a half years' purchase.—Apply, No. 7403, Mr. Percival Turner, 4, Adam-street, Strand, W.C. 2.

Yorkshire.— An old-established General PRACTICE situated in an unopposed district near the Coast. Receipts over £1500. Panel 528. Fees 2s. 6d. upwards. Nice house containing five bedrooms, &c., ½ acre of garden; rent £30 per annum. Premium £1500.—Apply, quoting Folio 624, Mr. W. S. Atkins, Medical Transfer Agency, 43, Bedford-street, Strand, W.C. 2.

Home County.—About £750 a year. Old-established PRACTICE. Opposition slight. Panel about 300. All sport. Good house, grounds, four bed, &c.; sale or let £40. Premium one and a half years' purchase.—Apply, No. 7400, Mr. Percival Turner, 4, Adam-street, Strand, W.C. 2.

Northants. — A General Practice situated in a large Town. Receipts about £1100, including panel £600. Fees 2s. 6d. upwards. Plenty of scope. Nice house containing six bedrooms, &c. No garden. Premium £1500.—Apply, quoting Folio 634, Mr. W. S. Atkins, Medical Transfer Agency, 43, Bedford-street, Strand, W.C. 2.

South-West County.—About £1300 a year. Unopposed. Old-established PRACTICE. Easily worked. Good house, large garden and orchard. Agricultural district. All sport.—Apply, No. 7378, Mr. Percival Turner, 4, Adam-street, Strand, W.C. 2.

To Purchasers.—Do not buy any Practice or Partnership without an investigation into books and other enquiries by an expert specially competent to conduct the same. Forty years' personal attention to such inquiries has given Mr. PERCIVAL TURNER an unique ability to advise in all cases. Terms and full particulars free on application to 4, Adam-street, Adelphi, Strand, W.C. 2. Telephone: 399 Gerrard. Telegram: Epsomian, London.

Home County, South.—About £1500 a year. Old-established PRACTICE. Practically unopposed. Fees 3s. 6d. to 10s. 6d. Panel over 700. Easily worked; not much Midwifery. Appointments about £130. Good house, five bed, &c., garage, ½ acre ground, tennis, &c.—Apply, No. 7402, Mr. Percival Turner, 4, Adam-street, Strand, W.C. 2.

London, S.E.—A Cash and Panel PRACTICE situated in a thickly populated district. Receipts £2600. Panel 1400. Fees 1s. 6d. to 3s. House situated in central position; rent £45 per annum. Premium £3500, or near reasonable offer.—Apply, quoting Folio 569, Mr. W. S. Atkins, Medical Transfer Agency, 43, Bedford-street, Strand, W.C. 2.

South Africa.—Special Nose and Ear PRACTICE. About £1200 per annum. First consultation £2 2s., £1 1s. after. Operations £10 10s. upwards. Handsome consulting- and waiting-rooms. Premium £1000, half down.—Apply, No. 7397, Mr. Percival Turner, 4, Adam-street, Strand, W.C. 2.

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Children's Sanatorium. With accommodation for 83 children, staff, and 3 teachers. Excellent position on West Riding Moors; 1000 feet above sea-level; facing south.

Good water-supply and own electric plant. Approved by Minstry of Health and Board of Education. Good income. Partnership may be entertained.

For price and further particulars write Gaunt, Foster & Co., Solicitors, 1, Cheapside, Bradford.

East Norfolk.—Very desirable Half Share PARTNERSHIP about £750 per annum. Panel 900 and other appointments. Old established; opposition negligible. Capable of considerable expansion. Excellent facilities for sport. Bungalow £50 per annum. Garden and garage; on rail; near sea and Broads. Premium 1000 guineas.—Apply, quoting Folio 841, Mr. W. S. Atkins, Medical Transfer Agency, 43, Bedford-street, Strand, W.C. 2.

Eastern County.—Urgent.—£800 a year.—Unopposed. On rail. Panel over 500. Detached house on lease. Schools near. Personally known. Premium one and a half years' purchase.—Apply, No. 7319, Mr. Percival Turner, 4, Adam-street, Strand, W.C.2.

Staffs.—An Old-established General PRACTICE, situated in a small Country Town with delightful surroundings. Receipts £1200. Panel 500. Fees 3s. 6d. upwards. Ample scope. Vendor retiring. Excellent house containing six bedrooms, &c., 2¼ acres of grounds and garage. Premium for Practice 1½ years' purchase. Premium for house, grounds, &c., £1500.—Apply, quoting Folio 617, Mr. W. S. Atkins, Medical Transfer Agency, 43, Bedford-street, Strand, W.C. 2.

North-West City.—£2000 a year.— Old-established PRACTICE. Panel 1900. Middle- and working-class Practice. No Midwifery taken. Fees 3s. 6d. and upwards. Nearly all ready cash. Corner house. Freehold £1000. Goodwill 1½ years' purchase. Personally known.—Apply to Sole Agent, No. 7384, Mr. Percival Turner, 4, Adam-street, Strand, W.C. 2.

Park Crescent, Portland Place, facing Ornamental Gardens.—Spacious HOUSES to be Let on Leases for about 40 years as Private or approved Professional Residences, or for conversion into good Maisonettes.—Apply to Mr. John Murray, F.S.I., 11, Suffolk-street, Pall Mall, S.W. 1.

Charming Nursing Home and 9 acres (25 minutes Charing Cross). Full up. Would do paying guest House. Land could be let off.—Particulars, Holmes, 9, Bruton-street, Bond-street, W.

Medical Establishment or Nursing Home.—Opportunity offers to secure a property just outside a Large Town with ample scope. Accommodation seventeen bed- and dressing-rooms, four reception-rooms, six bathrooms, excellent offices. Charming grounds about 40 acres with stream.—Address, No. 211, THE LANCET Office, 423, Strand, W.C. 2.

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A commanding modern building (formerly Rhos-on-Sea Preparatory School) is now at liberty. (VACANT POSSESSION.) It has 4,000 sq. yards of beautifully laid out grounds. The premises are admirably suitable for a Nursing or Convalescent Home, Hospital or Institution, or School.

Purchase money by instalments to suit purchaser, or by a Chief Rent, Debentures, or other first charge, saving Capital outlay, and preserving the benefit and goodwill.

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Portman-square (close to), Excellent CONSULTING ROOM with use of Waiting Room and third room if required; also Unfurnished MAISONETTE in same Residence available, consisting of four or five rooms and bathroom, &c.—For particulars and card to view apply, Ralph Pay & Taylor, 3, Mount-street, Berkeley-square, W. 1.

Consulting Room, unfurnished, to Let, with use waiting-room and service. Mayfair, near Piccadilly. £160. Gas, h. and c. water, and 'phone available.—Address, No. 218, The Lancet Office, 423, Strand, W.C. 2.

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First Floor Consulting Room, three and a half guineas weekly, including door-plate, use of waiting-room, attendance, &c. Can be seen any time.

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Dr J. FIELD HALL

MEDICAL TRANSFER AGENT,

28, CRAVEN STREET, STRAND, W.C. 2.

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" 2099

Telegrams
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Medical Transfer Agency,

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Near East Coast.—Increasing PRACTICE of over £1000 in Country Town with Cottage Hospital. Panel 400. Clubs £80. Premium £1200 or near offer. House with large rooms in excellent position.

S. W. County.—Unopposed Practice near a Country Town. Receipts about £1400. Appointments £200. Panel worth £520; 25 Midwifery. Well-built house, with detached surgery, garage, and nearly two acres.

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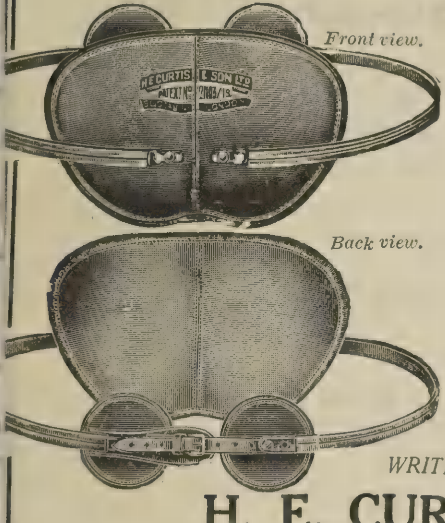

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